The Canadian Medical Association Inurnal

Vol. XXV

TORONTO, DECEMBER, 1931

No. 6

SPORADIC TYPHUS FEVER*

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IT is at present well recognized that typhus fever occurs in sporadic or isolated instances over the northern half of this continent. The difficulty in clinical and anatomical diagnoses suggests that these sporadic cases may be more numerous than is generally recognized. The case recorded below is of this order. It raises certain interesting points in diagnosis and means of infection which warrant its publication. It it, moreover, rare that the opportunity to study these spontaneous cases clinically and anatomically is offered.

CASE REPORT

A male adult, 32 years of age, a barber by trade, living in one of Montreal's poorer districts, became ill on November 22, 1930. His complaints were general malaise, headache, sore throat, generalized pains and soreness. Within a few hours he had a chill, followed by vomiting. He was not able to work on the next day. On the second day of his illness a rash developed, first over the anterior surface of the chest, later becoming generalized. On suspicion of scarlet fever, the patient was removed on November 24th to the Infectious Diseases Hospital. His chief complaints were then generalized pains, prostration and rash.

Physical examination showed a well nourished adult male; lethargic; temperature 104°. The face was flushed, the conjunctivæ injected. The lips and tongue were dry, the latter coated. The throat was reddened. The tonsils were enlarged, red, and exuded a purulent material. The submaxillary lymph glands were enlarged. There were diffuse moist and dry râles over the course of the larger bronchi. The spleen was palpable just below the left costal margin; otherwise the abdominal examination revealed nothing abnormal. There was a diffuse pink maculate erythema covering the entire body and face, less marked over the upper and lower extremities. The colour disappeared on pressure. Otherwise there were no further abnormal findings or routine physical examination. Pediculi were not found on the head or body.

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Urine: The specific gravity was 1028; albumin plus, no casts. The Widal reaction was positive for B. typhosus in 1-80 dilution. Blood cultures on November

28th and December 4th gave no growth. White blood count: November 23rd and December 3rd: 6,000 per c.mm.

During the patient's stay in the hospital his temperature ranged from 103° to 104°, with morning remissions of one to two degrees. The face at first was flushed, became dull, apathetic, with a cyanotic tint. The eyes were expressionless; the conjunctivæ, injected. The mouth was foul. A thick, dry, brown coating of the tongue persisted. The throat was reddened and the tonsils necrotic. Heavy sordes appeared on the lips. The submaxillary lymph nodes continued to be enlarged. The bronchitis became progressively worse. The pulse became fast and thready, ranging from 120 to 160 per minute preceding death. The heart sounds were distant and weak. The abdomen remained soft, while the enlarged spleen persisted. The diffuse, pink maculate rash gradually deepened in colour to a dark reddish blue. Toward the end of the second week of the illness it diminished in intensity, leaving behind a brawny dis-coloration, with areas of petechiæ over the anterior part of the chest, knees and ankles, and over the dorsum of the elbows and wrists. There was a peculiar odour in the patient's room, more marked when the bed clothes were raised, described as "mousy" or "mouldy." This led one of the staff to suspect typhus fever from previous association with the disease. The patient gradually passed into a semi-comatose condition, with delirium, usually of the low muttering type but at times active. For the last two days of life he was in a state of complete unconsciousness, with involuntary micturition and defæcation.

On the evening of December 5th his temperature rose to 107 degrees, the pulse, which was fast and weak, to 160, and he died on the early morning of December 6th.

Post-mortem examination.—A well nourished white adult male of about the stated age. Fine petechial hæmorrhages were noted in the skin of the dorsum of the feet and ankles, knees, hands, wrists, elbows and forearms. There was moderate bilateral enlargement in the region of both submaxillary glands. Both tonsils were large, soft and dark red.

Diffuse petechial hæmorrhages were seen over both pleural surfaces, with no evidence of exudate. Small superficial ulcerations were present in the mucosa of the lower ileum, greenish grey in colour, without induration, and having no relation to the Peyer's patches. Spleen; wt. 350 grm., uniformly enlarged, soft and flaccid. At the upper pole was a typical small anæmic infarct. On section, the cut surface permitted scraping of abundant blood and pulp. Liver; wt. 1,480 grm., with numerous petechial hæmorrhages over the capsule. The substance bulged from the cut surface and showed similar small

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petechial hæmorrhages between early nutmeg markings. The aorta showed superficial yellow fatty intimal streaking just above the bifurcation.

The lungs, heart, pericardium, pancreas, gall bladder, testes, adrenals and kidneys were essentially negative on gross examination, except for the usual evidences of septicæmia. Unfortunately, permission to examine the brain or spinal cord was refused.

Blood culture (8 hours after death) gave B. coli,

probably a post-mortem contamination.

Microscopic examination.—Skin.—Sections through the areas of petechial hæmorrhage showed irregular flattening of the papillæ. The sudoriferous glands appeared small and atrophic. A few small capillary fibrinous thrombi were present in these areas. Some of these vessels were surrounded by a few scattered large granular cells resembling mononuclear phagocytes. Other larger pale nuclear cells appeared free of granules and resembled proliferating endothelial cells. A very few polymorphonuclears and plasma cells were found in the perivascular spaces of one or two thrombosed capillaries. These exudative and proliferative perivascular changes constitute what is generally recognized as "Fränkel's nodule." (See Figs. 1 and 2).

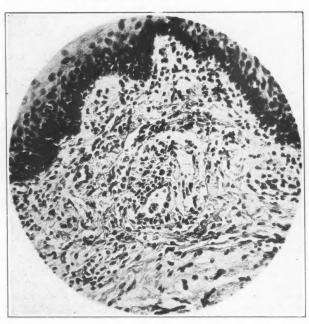


Fig. 1.—Section of skin from a petechial area, showing dilated small vessels. Rickettsia bodies were present in the surrounding proliferating endothelial cells. This constitutes the so-called "Fränkel's nodule." (x 100).

Sections of the skin fixed in 10 per cent formalin were put through Zenker's fluid after being cut. These slides were then treated with Giemsa's polychrome stain (Wolbach's modification). Preparations for the demonstration of Rickettsia bodies showed very numerous fine red-staining bodies within the endothelial cells lining many smaller arterioles and capillaries. The granules were most numerous in the endothelial cells surrounding the thrombosed capillaries. The large mononuclear darker-staining cells and all other tissue cells were free of granules. These dark red staining, discrete, granular masses were exactly similar in position and appearance to those described as Rickettsia bodies by Wolbach and Todd and others. (Fig. 3).

Posterior third of tongue.—Proliferative changes were more marked than in the section of the skin. Many small arteries and capillaries were surrounded by numerous, large, pale, nucleated cells resembling endothelium and a few large mononuclear phagocytic cells. These were separated by small deeply basophilic granular cells resembling mast cells and an occasional polymorpho-

nuclear leucocyte and plasma cell. There were very few thrombi but the vessels appeared compressed by the perivascular nodules. Stains similar to those used in the sections of the skin showed very numerous typical Rickettsia bodies. These bodies tended to completely fill the cytoplasm of many large endothelial-like cells. In some instances these discrete granules appeared definitely paired. (Fig. 4). Other similar appearing cells were completely free of granules. There was no evidence of fibroblastic proliferation surrounding any of the areas of perivascular cellular foci. Histological sections of tissue from a similar location of the skin and tongue from another case were prepared as negative controls. These slides were prepared as described above and showed no evidence of the vascular changes or of Rickettsia bodies.

Heart.—Sections of the heart were only examined from the middle of the lateral wall of the left ventricle. The lesions were almost entirely confined to the outer half of the myocardium. They consisted of numerous foci in which small mononuclear cells predominated. There were also a few large mononuclear cells and plasma cells, and in some instances a few polymorphonuclear leucocytes. These cells in every case surrounded

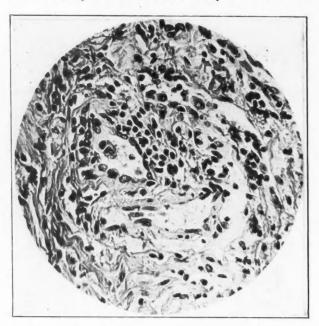


FIG. 2.—Section of the "Fränkel's nodule" shown in Fig. 1, under higher power. Note dilated capillaries lined by large endothelial cells. In some areas these cells are proliferating into the surrounding tissue. Scattered perivascular infiltration of mononuclear leucocytes. (x 500).

very small capillaries, but no definite thrombi were found. The surrounding muscle fibres appeared fragmented, but showed no evidence of necrosis. There was a slight uniform swelling and ædema of the fibrous tissue between the muscle bundles. No endothelial proliferations could be demonstrated. Rickettsia bodies were not found. These features are demonstrated in Fig. 5.

Liver.—There were many small focal areas of disintegrating liver cells, scattered small mononuclear cell forms and Küpffer's cells. Many of the latter were filled with a dark brown granular pigment. There were occasional plasma cells and polymorphonuclear leucocytes throughout the disintegrating foci. No definite capillary thrombi or endothelial proliferations were found. Polychrome staining was negative for Rickettsias.

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Spleen.—The pulp was filled with red cells, so that the lymph follicles appeared compressed. There was no definite increase in the reticulum. Large mononuclear cells appeared, however, more numerous than is usual.

Sections through the splenic infarct showed a typical dilated small artery filled with proliferating fibroblasts and mononuclear cells. There was nothing specific in the character of the infarct.

Heum.—Sections from the ulcerated areas showed disintegrating mucosa and many plasma cells and scattered large mononuclear cells surrounding the small arteries in the submucosa and muscularis. There were scattered capillary thrombi surrounded by these cells, with the addition of an occasional polymorphonuclear.



Fig. 3.—Section of dermis from field shown in Fig. 1. Note the dense mass of dark staining Rickettsia bodies within a large endothelial cell near the top of the photomicrograph. (x 1,500 oil immersion).

There was also definite endothelial proliferation surrounding some of these small capillaries.

Tonsils.—These showed an exudative follicular ton-

The kidneys, adrenals and pancreas showed no specific typhus lesions. The lymph glands, including the cervical, peribronchial, mesenteric and portal glands, showed only a catarrhal exudate.

DISCUSSION

H. T. Ricketts,1 working on the etiology of typhus fever in Mexico, described minute bacillary or pleomorphic bodies, with bipolar dark staining and intervening pale areas, in the blood of patients suffering from the disease. He described similar bodies in the dejecta of lice which had fed on typhus patients. Ricketts contracted and died from the disease before his work was completed. Von Prowazek,2 three years later, described paired granules in neutrophilic leucocytes of blood taken from typhus patients. Da Rocha-Lima³ demonstrated similar structures in the dejecta of lice which had fed on typhus patients. He contended that they multiplied in the epithelial cells of the stomach wall and were then given off in the fæces. In honour

of Ricketts and Prowazek, who lost their lives by the disease during their investigations, Da Rocha-Lima³ named these small structures Rickettsia-Prowazeki. Since that time other investigators, notably Töpfer, Schüssler, Wolbach, Todd and Palfrey¹ and Zinsser, have established more definite relations of some of these bodies

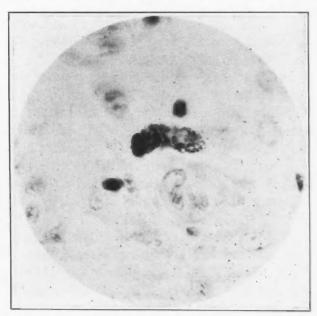


Fig. 4.—Section of the dermis from the base of the tongue. About the centre of the picture is a large endothelial cell containing many Rickettsia bodies. Note the paired arrangement in some instances. The surrounding tissue is slightly out of focus in this photomicrograph. (x 1,500 oil immersion).

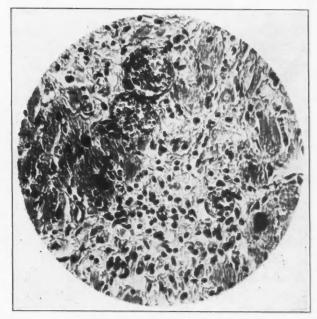


FIG. 5.—Section from myocardium of the left ventricle showing a focal area of infiltration of mononuclear leucocytes and plasma cells with ædema about small vessels. Note the fragmentation of surrounding muscle fibres with patchy hyperplasia. Endothelial proliferation and Rickettsia bodies not present. (x 500).

to certain diseases. At present as many as 18 to 20 types of Rickettsias are known.

In all cases the Rickettsia bodies have insect hosts. In the case of pathogenic forms these act as vectors or carriers. The definitive host in three types (R. Prowazeki, R. dermacentroxenus and R. quinta) is man. These are associated with the anatomical lesions of typhus, Rocky Mountain spotted fever, and trench fever, respectively. The organisms are transmitted to successive generations of insect carriers. (Ford).⁵

The last epidemic of typhus fever in the United States occurred in New York City in 1892-93, when 434 cases were reported (Maxcy). Since then, until the investigations of Brill,7 the disease was considered to be very rare and exclusively imported into North America. It was assumed that such cases owed their origin to immigrants from countries in which typhus fever was endemic. Brill, in New York City, described a disease clinically resembling European and Mexican typhus fever, but of a milder course. The disease, at first unrecognized as such (chiefly because it occurred in sections where contact with immigrants was improbable), was later accepted as typhus fever. The U.S. Public Health Reports as well as individual writers have recorded sufficient numbers of cases to indicate that the disease is endemic in certain sections of the United States. Maxcy reports that the disease occurs most frequently along the Atlantic seaboard from Mexico to Massachussetts and that it diminishes in frequency inland and north of New York City. of the cases reported were from isolated districts in persons who could not possibly have come in contact with other typhus patients, directly or indirectly, and upon whom no pediculi were present. Yet in some of these cases the typical pathological lesions of typhus fever, including the demonstration of Rickettsia bodies, were found at autopsy. These facts have caused a great deal of speculation upon the mode of transmission of these sporadic cases of the disease.

In the City of Montreal (a city with a population of about one million, and a large ocean port) the disease seems to be quite rare. Two of the large general hospitals, the Montreal General and the Royal Victoria, report 5 and 7 cases respectively over a period of 35 years (1895-1930). In geographical districts where

the disease is infrequent, therefore, the great majority of physicians do not come in contact with a recognized case. Consequently, they may not be in a position to differentiate the disease from some other acute infection, and it is possible that at least some cases of "atypical typhoid fever' may belong to this category. Even in autopsied cases the correct diagnosis may be missed unless the examiner is prepared to look for the characteristic anatomical lesions and the Rickettsia demonstration. On consideration of these facts it seems possible that the disease is not so infrequent with us as has been supposed, and that some cases pass undiagnosed or under another diagnosis. The case here presented might also have passed as an "atypical typhoid fever" (which indeed was at first assumed) had not one of the staff, under whose observation the case was, been acquainted through previous experience with certain clinical characteristics (odour) of the disease.

The question arises as to the source of infection in these endemic cases. In this instance, the occupation of the patient as a barber in one of the poorer districts of the city might expose him to contamination with infected pediculi. there is no evidence that he actually came into contact with immigrants from foreign countries in which typhus is prevalent. On the other hand, cases have been reported in which possible contamination' through infected pediculi could not be traced. It therefore seems possible that endemic cases may result from infections through some as yet unrecognized intermediate host. In this regard the recent investigations of Dyer, Rumreich and Badger⁸ suggest that typhus fever may be transmitted by fleas, as well as by lice. These workers were able to produce with infected fleas the clinical picture of typhus in guinea pigs. These animals gave a positive agglutination reaction with proteus X. Unfortunately there is no reference to the presence or absence of Rickettsia bodies in the tissues of their experimental animals. Observations by Maxey also indicate that the infecting agent may exist in rats and mice and transmission to man may be brought about by some blood-sucking arthropod.

It would seem justifiable to regard the case here reported as a genuine typhus infection. The clinical history, signs, the finding of definite intracellular bodies, apparently identical with those generally accepted as characteristic of typhus; in at least some of the local lesions, together with their anatomical and histological makeup and distribution, warrants, we believe, this diagnosis. Indeed it is interesting to note how close the resemblance in such a sporadic fatal case is to the typical epidemic cases, both in clinical course and anatomical lesions. It remains to be seen whether this applies to all sporadic cases or whether at times wider variations (as we know them to occur in most other of the more common infectious diseases) may be encountered. We hope that this publication may help in producing greater watchfulness in this direction.

BIBLIOGRAPHY

- RICKETTS, J. Am. M. Ass., 1910, 54: 1373.
 VON PROWAZEK, Beiträge zur Klinik der Infektionskrankheiten und zur Immunitätsforschung, 1915-16, 4: 5.
 DA ROCHA LIMA, Arch. f. Schiffs und Tropen Hyg., 1916, 20: 27.
- WOLBACH, TODD AND PALFREY, Typhus, Etiol. & Path., League of Red Cross Societies, 1922, Harvard University Press.
- Fress.
 Ford, Text Book of Bacteriology, 1927, Saunders Co., Phila., p. 1005.
 Maxcy, Weekly Pub. Health Report, 1928, 43: 3084.
 Brill, J. Am. M. Ass., 1910, 54: 1477.
 Dyer, Rumreich and Badger, U.S. Public Health Reports, 1931, 46: 7.

A CASE OF BALANTIDIUM DYSENTERY IN CANADA®

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THE rarity of Balantidium dysentery in man has prompted us to report what is to the best of our knowledge the first recorded case of the disease in Canada.

Since the first description of the parasite by Malmsten¹⁵ in 1857 down to the present date not more than 250 cases have been reported in medical literature. The geographical incidence is very widely distributed. Cases have been reported from such diverse latitudes and longitudes as Abyssinia, China, Egypt, Russia, Cuba, Ceylon, Norway, Sweden, Germany, France, Finland, Holland, Serbia, Austria, Porto Rico, Brazil, Venezuela, Honduras, Siam, Java, and the United States of America. In the last-mentioned country cases have been identified in Arkansas, California, Louisiana, Iowa, Minnesota, North Carolina, New York and Oklahoma. No cases have been recognized in Great Britain.

Craig⁸ reported that in many thousands of tions. Matthews and Smith¹⁶ examined 23,024 specimens from 4,068 soldiers, most of whom were convalescent from dysentery, and failed to find a single case of Balantidial infection.

Fox (1927) quoted an infection in an infant.

fæcal examinations he found the organism on not more than a half dozen occasions. Cort7 found the parasite 14 times in 8,000 examina-

All ages are susceptible to the infection. DeBuys⁹ described a case in a child of five, while

Males are more commonly infected than females, due no doubt to their more frequent occupational contacts with the infecting host.

A glance at the geographical incidence listed above makes it obvious that there is no racial immunity, and that the affection cannot be relegated to the category of tropical diseases. It is important, however, to note that Walker²¹ referred to 57 cases occurring in the Philippine Islands alone.

CASE REPORT

W. H. This elderly, white, railroad-labourer was born in England, 69 years ago, and emigrated to Canada at the age of 23. Since that time he had been alternately employed as a farm-labourer and section-hand on the railway.

Fourteen months ago he developed maniacal and suicidal behaviour and was finally (February 28, 1931) committed to the Ontario Hospital for the Insane at Hamilton, diagnosed as "psychosis with cerebral arteriosclerosis'

On admission the only positive findings noted in addition to his mental state were:— general weakness, sclerosed peripheral arteries, pallor of mucous membranes, anæmia, (red blood cells 3,987,000, white blood cells 5,400, hæmoglobin, 68 per cent).

After he had been in the ward some weeks he suddenly developed severe cardiac symptoms and the examining physician had him transferred to the On admission to the latter (March 4, 1931) firmary. his pulse was 48, lips ædematous, heart sounds irregular in force and rhythm, and a roughening was heard at the apex throughout the first sound. The nurses reported that he was having frequent bowel movements with complaints of colicky pain and feeling of distension.

further enquiry into this patient's history revealed the fact that for some years back he had suffered distressing fullness, with belching of gas and colicky abdominal pains. Two years previous to admission he began passing thin watery stools, as many as ten daily, and without relief for more than an interval of one week up to the date of admission. He never saw any

^{*} From the Department of Pathology and Bacteriology, University of Toronto.

blood or mucus (but here we must take into consideration the patient's mental state).

Rectal examination at this date revealed nothing. The leucocytes fell to 3,600, and the patient was evidently losing weight. The author had the opportunity of examining the stools, in an attempt to determine the etiology of the disease. One ounce of magnesium sulphate was given at 6 a.m. At 10 a.m. a thin, muddy or ash-coloured, watery, offensive stool was secured in a warmed pan and taken immediately to the laboratory, where it was kept warm for the ensuing half-hour. portion of mucus was streaked on blood agar, eosinmethylene-blue agar and on litmus-lactose agar plates. No pathogenic organisms appeared during the following forty-eight hours. A hanging-drop preparation of a portion of mucus from the stool was examined at once. Meanwhile a second drop was stained with Donaldson's eosin-iodine stain, with a view to searching for amæbic cysts. Permanent smears of mucus, fixed in hot Schaudinn's solution and stained with Wright's blood stain, were prepared for future study and photography. The mucus in the hanging-drop preparation was literally boiling with the organisms about to be described,as many as ten in a low-power field (x80).

motion is limited to a continuous rolling over and over. Finally the organism begins to round up and its motility gives place to a feeble paddling of the cilia, particularly those about the anterior end. In a cool medium all movement ceases. The form of the organism in its living state is very typical and can scarcely be overlooked in an examination of mucus from an infected stool. The shape may be slightly altered as the organism bores its way through crowded quarters, but it soon resumes its shape in free fluid.

The parasite possesses a greenish-yellow, oval, elastic body entirely surrounded by waving cilia, which are arranged in longitudinal parallel rows. A clear, hyaline ectosare invests the



Fig. 1.—Balantidium coli (x 200). Note relative size of polymorphonuclear leucocytes to Balantidium.



Fig. 2.—Balantidium coli (x 600). Note cytostome and horseshoe nucleus.

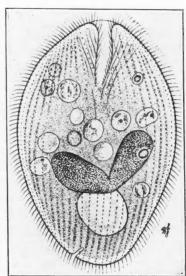


Fig. 3.—Schematic diagram of Balantidium coli (after Wenyon, 1926).

tive or cystic amæbæ were observed over a further search of some eight or ten stools passed voluntarily or returned after warm saline enemata.

Under a guarded diet and various medicamenta per os and anum, the patient continued discharging organisms. A trial is being made with oil of chenopodium and a further report may be available.

MORPHOLOGY

The parasite belongs to the ciliated, infusorial protozoa. It is the largest protozoan occurring in the human intestine. While visible to the naked eye it is not recognizable without the aid of a microscope. Dobell and O'Connor¹0 give the width as 40 to 60 microns and the length as 50 to 70 microns. The living parasite swims into the field propelled by innumerable cilia. It advances rapidly with a rotary motion, but as the environment cools the progress ceases and

more granular-appearing endosarc. The anterior end is slightly pointed in contrast to the rounded posterior end. The ectosarc is interrupted by two orifices, the cytostome and the anal pore. The cytostome is a funnel-shaped mouth situated slightly ventral to the anterior end and into which the ectosarc infolds in an attempt to line the primitive gullet. The cilia in the area of the cytostome are longer than elsewhere and keep up a continuous inward whirling motion which wafts food particles into the body of the parasite. Posteriorly, from a small anal pore in the ectosarc, minute particles of waste are discharged. Within the granular endosarc lie two contractile vacuoles which pulsate about once per minute depending upon the temperature of the suspending medium. More important are the large sausage-shaped or bean-shaped macronucleus and the small globoid micronucleus. These may lie in any plane or area in the endosarc. Numerous small food vacuoles are scattered throughout the remainder of the cytoplasm.

In stained preparations the finer details are brought out. The cuticle appears as a grooved structure along the base of which innumerable fine apertures are arranged. These grooves run longitudinally and from the minute apertures in their base the delicate, hair-like cilia arise. It is the alternation of crests and grooves which produce the striations observed on the cuticle and plainly visible in Fig. 5. The adoral cilia waft floating particles of starch, bacteria, blood cells, etc., into the gullet or so-called esophagus.

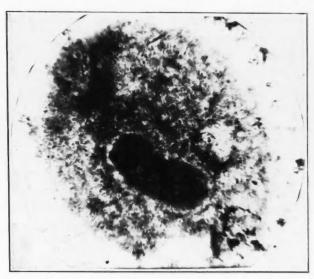


Fig. 4.—Balantidium coli (x 1,350). (Oil immersion). Note sausage-shaped nucleus.

From this point the food is dispersed into the endosare and digested in small vacuoles.

In the spherical cyst forms, which are somewhat smaller than the free parasite, no cilia are observed and vacuoles are recognized with difficulty. The striations and nuclei are visible but reduced in size. The cysts measure from 40 to 60 microns and are undoubtedly the largest protozoal cysts found in the human fæces.

ANIMAL HOSTS OTHER THAN MAN

Leuckart,¹³ Stein¹⁹ et al. report that the parasite is a common inhabitant of the intestine of the hog. Brooks,⁵ Noc,¹⁸ and Walker²¹ report natural and experimental infections in monkeys of various species. Behrenroth² reported an experimental infection in a kitten. Bowman⁴

however has reported failures to infect monkeys, even after suturing the ulcer to the intestinal wall of his monkeys, and injecting fæces from an active balantidial dysentery case into colotomy openings in *Macacus cynomologus*.

CULTIVATION

Barrett and Yarbrough¹ were able to successfully cultivate *Balantidium coli in vitro* through 11 transplants over a period of 32 days, observing multiplication mainly by binary fission and occasional conjugation. Faust¹¹ describes a method of obtaining the organisms in pure culture.

Mode of Transmission

It is generally accepted that the infection is transmitted by cysts discharged from an active

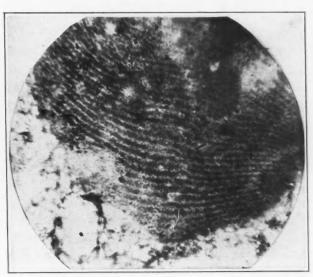


Fig. 5.—Balantidium coli (x 1,350). (Oil immersion). Note striated ectosarc.

or chronic carrier. These cysts are ingested along with contaminated food or drink, or by the more direct route of the fingers, or, more revolting still, contamination of the lips of slaughter-house employees by splashing fæces from the hog's intestine. The cysts apparently pass the acid barrier of the stomach safely and liberate their contents in the large intestine, particularly in the area of the cæcum, where the vegetative stage of development is resumed.

Craig⁸ reported that 30 per cent of the recorded cases gave a history of direct contact with pigs, or of eating pork products prepared in such a manner that the cysts would have been present and viable at the time of ingestion. In contrast, Bode³ quoted Shegalow who examined 54 men in St. Petersburg in 1899 who

were gut-strippers in a slaughter house. Forty per cent of the hogs were infected but none of the men. Many people of other occupations in that vicinity, however, were infected. On the whole, there were very few cases in Russia, considering the fact that people dwelt in the same building with their hogs. Klein¹² reported finding the parasite in the sewage and drinking water of London. Chichulin⁶ reported the infection of an entire family by eating sausages made from a hog which harboured Balantidium.

PATHOGENICITY

Walker²¹ found that of 57 cases in the Philippine Islands, only 11 showed dysenteric symptoms, with a mortality rate of 7 per cent. He further pointed out that in 40 post-mortems ulcers of the large intestine were described in 36. The mortality rate in 111 cases analyzed by Strong (1904) was 29 per cent. With such statistics the *Balantidium coli* cannot be regarded as a harmless commensal, but a cause of serious disease and associated with a fairly high mortality rate.

PATHOLOGY

Bowman4 described the macroscopic lesions as confined almost entirely to the large intestine. The small intestine is rarely involved, except by a spread into the distal few inches of the ileum. The cæcum may measure as much as 3 cm. in thickness, while the colon and rectum may present islands of ulcerated and necrotic tissue. The ulcers vary from 0.5 to 4 centimetres in diameter. They bear no distinct relationship to the mesenteric attachment. The early ones are shallow, and are neither injected at the edges nor undermined. From the larger and older ulcers hang tags of black necrotic tissue and the edges are undermined, indurated and injected. The base may be thin, only the serosa intervening between the bowel lumen and the serosal cavity. There is no means of identifying macroscopically the late-stage ulcers of Balantidial colitis from those produced by Entamæba histolytica infection. Between the ulcers the mucosa may appear normal or be swollen and show hæmorrhagic areas. In the ulcer a thick glairy mucus containing Balantidia may be observed. parasites may also be found in the capillaries and lymph channels of the infected tissue and in the neighbouring lymphatic glands.

Parasites may be observed, microscopically, in all the layers of the intestinal wall, submucosa, mucosa and muscular coat. At the onset they tend to be grouped in nests in the submucosa, the overlying mucosa being intact. The cellular reaction in these nesting areas consists of a few plasma cells and lymphocytes. In the ulcerated areas, however, secondary invading organisms stimulate a heavy reaction of polymorphonuclear leucocytes and thick mucus.

Symptoms

The symptoms begin as a mild, intermittent, watery diarrhoa, which increases in severity until dysentery is established. The stool becomes tinged with flakes of bloody mucus. Later still, the patient suffers five to fifteen movements daily. These are of a thin muddy consistency, containing bits of necrotic tissue, and have an offensive odour. From simple anorexia and indigestion the disease progresses through the stages of tenesmus, anæmia, exhaustion and, possibly, perforation. Continuous cramp-like, colicky pains radiate through the abdomen, and a mild fever is present.

DIAGNOSIS

Diagnosis depends on the discovery of the parasites in portions of mucus passed in the stool during an attack. This is best accomplished by collecting the return from a warm saline enema in a warmed pan and examining a portion of the mucus in a hanging-drop preparation on a warm stage. Smears fixed in hot Schaudinn's solution may be stained by Wright's blood stain to demonstrate greater detail. Examination of the blood usually reveals a leucopenia, associated with reduction in the number of erythrocytes and distortion of their shape.

TREATMENT

Apart from dietary therapy the administration of various drugs by mouth, by vein and by enemata has proved efficacious in the hands of various workers, but the tendency of the disease to natural decline and recurrence tends to dampen enthusiasm in regard to a cure. Cort, in Siam, treated 12 cases with enemata of 15 c.c. of oil of chenopodium in 150 c.c. of olive oil. No untoward results followed the single administration, and cures were reported in all cases. Each case remained negative to repeated examinations over a period of from nine to twenty-

eight months. Prior to Cort's work most authors agreed that symptoms usually returned sooner or later, and that the disease tended towards a fatal ending.

SUMMARY

1. A case of human infection with Balantidium coli (two years' duration) has been recognized in an English immigrant who had not been out of Canada in the last 46 years.

2. In the absence of other pathogens, either bacterial or protozoal, in this patient's discharges, we conclude that the dysentery is the result of Balantidial infection.

3. We are also led to conclude that the severe wasting, exhaustion and anæmia are related to the progress of the protozoal infection.

In conclusion, I wish to thank Dr. L. N. Easton, of the Ontario Hospital at Hamilton, for the use of his elinical notes; Prof. W. L. Holman, for his aid in identifying the organism; and Prof. Oskar Klotz, whose

kindly interest in the investigation and the report made the presentation of this case possible.

REFERENCES

- 1. BARRETT AND YARBROUGH, Am. J. Trop. Med., 1921, 1: 161.
- 2. Behrenroth, Arch. f. Verdaungskrankh., 1913, 19: 42.
- Bode, Gentralbl. für Bact., etc., 1923, abt. 1, Orig. Bd. 89: 285.
- 4. BOWMAN, J. Am. M. Ass., 1911, 57: 1814.
- 5. Brooks, New York Univer. Bull. Med. Sc., 1902, 2: 1.
- 6. CHICHULIN, Voyenno Med. J., Med. Spec., 1900, p. 78.
- 7. CORT, J. Am. M. Ass., 1928, 90: 1430.
- CRAIG, The Parasitic Protozoa of Man, Lippincott, Phila., 1926, p. 517.
- 9. DEBUYS, Am. J. Dis. Child., 1918, 16: 123.
- DOBELL AND O'CONNOR, The Intestinal Protozoa of Man, Bale, London, 1921.
- 11. FAUST, Proc. Soc. Exper. Biol. & Med., 1930, 27: 648.
- 12. KLEIN, Brit. M. J., 1896, 2: 1852.
- 13. LEUCKART, Weigemann's Arch., 1861, 1: 80.
- 14. LOGAN, Quart. J. Med. Sc., 1921, 162: 668.

- MALMSTEN, Virch. Arch., 1857, 12: 302.
 MATTHEWS AND SMITH, Am. J. Trop. Med. & Parasit., 1919, 13: 83.
 McEwen, Med. Clin. of N. A., Saunders, Phila., 1924, 7: 1320.
- MCEWEN, Mett. Coll., 1910, 19

- STRONG AND MUSGRAVE, Bull. Johns Hopkins Hosp., 1901,
 31.
 WALKEE, Philippine J. Sc., 1913, 8B: 333.
 WENYON, Protozoology, Wm. Wood & Co., New York, 1926,
 p. 1201.

OCCLUSION OF THE MESENTERIC ARTERIES*

(WITH THE REPORT OF FIVE CASES)

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THE various aspects of mesenteric vascular occlusion have received considerable attention in the literature, especially during the past thirty years. Until comparatively recently, however, no consistent effort has been made to differentiate clinically and pathologically between arterial and venous occlusion, although Trotter9 in 1913 clearly laid down the principles upon which such a differentiation should be based. The tendency in the past has been to emphasize the resulting hæmorrhagic infarction of the intestine and its consequences rather than the vascular lesion that produced it. This is not the case with similar lesions in other parts of the body, where the etiology is stressed. general lack of consideration of the cause of the vascular obstruction in mesenteric occlusions is one of the reasons why we are reporting a series of these cases that have occurred in The Montreal General Hospital. While this paper deals

especially with occlusion of the mesenteric arteries and its results, reference will also be made to occlusion of the mesenteric veins.

The first case of mesenteric vascular occlusion was reported by Tiedemann¹ in 1843 and was arterial. Four years later Virchow presented two similar cases and accurately described the pathology of the lesion.^{2, 3} Since then, over 500 cases have been reported, 300 of these being arterial.

The proportion of arterial to venous occlusions has been variously estimated to be from 2:1 to 5:1. The true ratio is probably closely approximated to by Trotter⁹ who, in an analysis of 360 collected cases and 6 of his own, found that 53 per cent were primarily arterial and 41 per cent venous, while in 6 per cent both arteries and veins were involved. In the last group it was impossible to state which was primary. The predominance of arterial cases in the literature may be only apparent. Because of the suddenness and greater severity of the

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symptoms this group is, clinically, very striking. The mortality figure for combined arterial and venous cases is 94 per cent—arterial 96 per cent; venous 92 per cent. Elliott⁷ reported the first successful operation on a case of mesenteric venous thrombus in 1895. Since then the more frequent recognition of the condition, earlier diagnosis, and improved surgical technique have led to a progressive improvement in these figures. Brady¹¹ reported a mortality of 72.5 per cent in the fourteen cases that occurred at the Johns Hopkins Hospital between 1895 and 1923, this improvement being due wholly to the number of successful operations. Since Brady's paper a larger proportion of cases have been operated upon and the number of recoveries following operation has steadily increased. At best, the mortality is higher and the results in arterial occlusion continue to be much less satisfactory than in the venous type. The condition still remains one of the gravest. This is illustrated by the following five cases which have occurred in The Montreal General Hospital during the past ten years.

Case 1

M. G. H. No. 2108-25. Admitted May 10, 1925, and died the same day.

History of illness.-H. R., a male, aged 60 years, was seized suddenly with severe generalized colicky abdominal pain, thirty-six hours before admission. The attack awakened him at night and was followed shortly by retching, vomiting and prostration. The following morning the bowels moved naturally and nothing abnormal was noted about the stool. By this time, however, the pain had become continuous and was most marked in the right lower quadrant. Vomiting continued at intervals and the patient became febrile. On the day of admission, the pain shifted from the right lower quadrant to the left lower quadrant and distension developed. During a period of 20 years prior to admission he had been seen at intervals by a member of this hospital's staff on account of mitral valvular disease following rheumatic fever. During this time cardiac decompensation had occurred on three occasions, the last three months prior to admission. Just previous to this he had suffered from complete amnesia for ten days, attributed to cerebral embolus. This condition had entirely cleared up.

Physical examination.—The patient was in a condition of shock. The temperature was 102.4°; pulse 108, irregular; respirations 24. The extremities were clammy and cyanotic. There was some abdominal distension; limited movement on respiration and muscular splinting with tenderness, especially over the left lower quadrant. No mass was felt, nor was there dullness in the flanks. Rectal examination was negative. The circulatory system showed cardiac decompensation with pulse deficit. The heart was enlarged somewhat to the left. No murmurs

were heard. Blood pressure, 90/40.

Clinical course.—The patient was given glucose-saline (10 per cent) intravenously, and digitalin hypodermically. Enemata were effectual but the stools did not contain blood. The patient rapidly became weaker and died four hours after admission to the hospital, and forty hours after the onset of symptoms.

Clinical diagnosis.—Mesenteric thrombosis following cardiac embolism; infarction of the intestines; general peritonitis.

Autopsy.—(M. G. H. A-25-111). The peritoneal cavity contained a moderate amount of sero-sanguineous odourless fluid. The whole jejunum and a portion of the proximal ileum were purplish and greatly distended. Distal to this, the ileum showed patches of greenishbrown discoloration, but was not much distended. The colon throughout showed no gross lesion. The superior mesenteric artery and its branches distal to the right colic artery contained a propagating thrombus of recent origin. The heart was enlarged. Both auricles and the right ventricle were greatly dilated. The mitral valve was stenosed, calcified and showed a small area of acute exudate on the edge of one cusp. There were some, but not extensive, atheromatous changes in the descend-

Pathological diagnosis.—Thrombosis of the superior mesenteric artery and its branches, following embolism of cardiac origin; infarction of the jejunum and a portion of the ileum; early general peritonitis; acute and chronic endocarditis and stenosis of the mitral valve; cardiac hypertrophy and dilatation.

Case 2

M. G. H. No. 548/25, admitted on February 6,

1925, and died the same day.

History of illness.—O. S., a male, aged 70 years, was admitted complaining of severe pain in the lower half of the abdomen. On the evening previous to his admission he was suddenly seized while at stool with severe colicky abdominal pain. The pain was so severe that he almost lost consciousness. Within three hours there was diarrhoa with fresh blood in the stools. It is of interest to note that on the following morning he was driven by sleigh six miles to a railroad station, and

made a ninety-mile railroad journey to Montreal.

Previous history.—During his 'teens, he had had a severe attack of rheumatic fever, but had never known that he had a heart lesion until he consulted his family physician for a "cold" two months prior to admission. He had had bilateral inguinal herniæ for fifteen years.

Physical examination.—Temperature 96.2°; 80; respirations 20. The patient was in a condition of moderate shock, with cold clammy extremities, anxious facies and cyanosis. The abdomen was uniformly rigid and tender, but especially so in the lower half. The liver and spleen were not was no distension. palpable. The percussion note was a little impaired in both flanks. The bilateral herniæ were easily reducible. On rectal examination there was no tenderness or palpable masses, nor was there blood on the examining finger. The pulse was 80, irregular, of small volume and low tension; blood pressure, 90/28. Relative cardiac dullness was slightly increased to the left. The heart sounds were distant and indistinct and there was a soft blowing apical systolic bruit. At the bases of both lungs resonance was impaired and coarse moist crepitations could be heard.

Urine.—Acid; sp. gr. 1025; alb. +; sugar +; acetone +

Blood chemistry.—Urea nitrogen 17 mg. per 100 c.c.;

sugar 0.137 mg. per 100 c.c.

Glucose saline intravenously and adrenalin were given in an attempt to condition the patient for operation, but he failed to respond and three hours after admission developed convulsions. He died suddenly twenty hours after the onset of his symptoms.

Clinical diagnosis.—Mesenteric arterial thrombosis; infarction of the intestines; chronic valvular disease of

the heart, both mitral and aortic.

Autopsy.-(M.G.H. A-25-18). The peritoneal cavity contained 300 c.c. of sero-hæmorrhagic fluid. The small intestine, except for the duodenum and the proximal three feet of the jejunum, was reddish grey to deep purple and greatly distended. The colon was normal in colour and collapsed. The superior mesenteric artery and its branches distal to the right colic artery contained a recent thrombus. The mid-colic artery was free. The heart showed enlargement, old endocarditis and marked calcification and rigidity of both mitral and aortic valves. On the surface of both of these valves were large calcareous excrescences. The pulmonary and tricuspid valves showed no gross lesions. The descending aorta showed large patches of atheroma, but with very little calcification.

Pathological diagnosis.—Thrombosis of the superior mesenteric artery and branches distal to the right colic artery, following an embolus of cardiac origin; local infarction of the ileum and a portion of the jejunum; general peritonitis; mitral and aortic endocarditis with calcification, stenosis and incompetence.

CASE 3

M. G. H. No. 4116-26., admitted August 18th, and died on August 20, 1926.

History of illness.—P. O., a male, aged 46, was awakened from his sleep on the night previous to his admission with severe colicky pain in the left lower abdomen. He vomited partly digested food an hour and a half later. The pain continued intermittently during the night. His bowels did not move. He voided painlessly three times during the night. For the previous three weeks there had been some indefinite indigestion. Otherwise he had been well. In 1919 he had had a similar attack of pain which, however, lasted only two hours.

Past history.-Pneumonia followed by empyema at the age of 10 years. In 1919, following a prolonged exposure from shipwreck, he first suffered painful swelling of his feet, which came on at varying intervals. The same year he entered a hospital in Chicago where the diagnosis of Buerger's disease was made, and later three toes of one foot were amputated. In 1925 he entered the Royal Victoria Hospital, Montreal, where Buerger's disease was again diagnosed. Later in the same year, he was admitted to the Montreal General Hospital where the same diagnosis was made (M. G. H. At this time he had glycosuria and was put on a suitable diet. While still under investigation he developed acute appendicitis. Operation showed gangrenous appendicitis with abscess formation. After recovery, a barium series gave evidence of a gastric ulcer and a suitable diet was prescribed. All of his teeth were removed because of severe pyorrhea. He had some hypertension (165/90) and general arteriosclerosis. After six weeks he left the hospital considerably improved. On discharge, Dr. Campbell P. Howard made the following note, which is of great interest in the light of subsequent events,— "Of interest is the question whether the patient's mesenteric arteries are involved in the same process as those of his extremities. The appendicitis and gastro-intestinal symptoms would seem to bear this out, and the glycosuria could be explained on

the basis of involvement of the pancreatic arteries."

At examination on his final admission, he was in marked shock; temperature 96°; pulse 144, and respirations 20. The extremities were cold, cyanosed and clammy. The chest and abdomen also showed cyanotic patches. The heart rate could be counted only by the The chest and abdomen also showed cyanotic The radial pulse could not be felt and stethoscope. there was evidence of marked venous and capillary stasis. Blood pressure 80/50. On percussion no enlargement of the heart could be made out. The heart sounds were feeble and distant. There were no murmurs. The abdomen showed a slight fullness in the left lower quadrant, but no general distension. There was increased resistance and tenderness throughout, but these were most marked in the left lower quadrant. In this region a mass was felt, over which the percussion note was impaired. The liver and spleen were not felt. On rectal examination there was acute tenderness in the left side of the pelvis, but no mass could be felt.

Urine.—Acid; sp. gr. 1010; albumin ++; sugar 0;

microscopically many red blood cells and white blood cells; numerous granular and a few cellular casts.

White blood cell count 40,200.

Blood chemistry.—Urea nitrogen 48 mg. per 100 c.c.;

sugar 0.227 mg. per 100 c.c.

Expectant treatment was necessitated by the patient's condition. He failed to rally and developed persistent vomiting, which later became facal. On the day after admission his stool contained a large amount of fresh and dark blood. He became comatose and died, thirty-six hours after the onset of his symptoms.

Clinical diagnosis.—Thrombosis of the superior mesenteric artery; infarction of the intestines; Buerger's

disease.

Autopsy.—(M. G. H. A-26-151). The peritoneal cavity contained a small amount of sero-sanguineous fluid and gas under tension. The whole small intestine was congested and distended. Beginning four feet from the ileo-cæcal valve and extending upward for 30 cm. the small bowel was gangrenous, and the corresponding mesentery had a dark necrotic appearance. Five centimetres from the ileo-cæcal valve, in a second small patch of gangrenous bowel, was a perforation 5 mm. in diameter. The colon contained a considerable amount of fresh and dark blood.

The descending aorta showed extensive ulcerative and calcareous changes. Numerous large organizing thrombi were attached to the ulcerated areas. The orifices of all the branches of the descending aorta were involved in this process to a greater or lesser extent, and some of them were almost completely occluded. The opening of the superior mesenteric artery was very small and extending into it was a tag of thrombus from one of the ulcers. This artery showed a mural thrombus encircling the wall and distal to this a loosely formed propagating thrombus which completely occluded the lumen of the main artery and branches distal to the mid-colic artery (see Fig. 1). The small tributaries of



Fig. 1.—Photograph of a drawing (Case 3) showing thrombosis of the ulcerated aorta, of the right renal artery, and of the superior mesenteric artery. The last led to infarction of the ileum with gangrene and perforation.

the superior mesenteric vein in the gangrenous areas were thrombosed. The orifice of the cœliac artery was small, but the vessel and its branches were patent. The right renal artery was very small and partly occluded by a thrombus in the aorta. The right kidney was completely involved in an old infarction. At the bifurcation of the aorta the right common iliac artery was almost occluded, but lower down opened out to its normal size. The right anterior tibial artery and its continuation were represented only by a white fibrous cord. This was traced distally to the stumps of the amputated toes. The arteries of the neck and cerebrum were not investigated, but the innominate, left common carotid and left subclavian all showed the arteriosclerotic process to the

same extent. The heart muscle was firm. There were numerous sub-endocardial ecchymoses in the left ventricle. The coronary arteries showed moderate atheromatous changes, especially at their orifices. The heart valves and ascending aorta showed no gross lesions. There were no evidences of peptic ulcer.

Pathological diagnosis.—Rapidly advancing arteriosclerosis; embolism and thrombosis of the aorta; thrombosis of the superior mesenteric artery; infarction of the ileum with gangrene and perforation; thrombosis of tributaries of the superior mesenteric vein; early general peritonitis; thrombosis of the right renal artery with infarction of the whole kidney; organized thrombosis of the right anterior tibial artery and its continuation.

CASE 4

M. G. H. 6536/28, admitted on November 12th, and died on November 24, 1928.

History of illness.—R. A., a male, aged 42 years, was first admitted in April, 1928, suffering from a penetrating duodenal ulcer (M. G. H. No. 1033/28). He was treated medically and relieved by diet and alkalies. Following his discharge he gained considerable weight. While at work, five weeks prior to the last admission, he first felt chilly and feverish. He continued to have these symptoms daily with occasional severe sweating. There was loss of weight and strength. Three weeks later he stopped work and consulted a physician because of pains in the legs. He had been confined to bed, however, for only three days prior to admission. On the day before admission he developed severe and persistent pain in the left side of the abdomen.

Physical examination. — Temperature 103°; pulse 148; respirations 26. Expression anxious; conjunctivæ suffused; tongue coated; lips dry, cracked and cyanosed. There was cyanosis of the extremities. Movements of the abdomen with respiration were free. There was moderate symmetrical distension. Muscular resistance was increased over the right upper quadrant. There was marked tenderness in the left flank. The edge of the liver was palpable three fingers' breadth below the costal margin. The spleen and kidneys were not palpable. Rectal examination was negative. The pulse was rapid and thready. The heart was not enlarged and no murmurs were heard. Resonance was impaired at the base of the right lung, but the breath sounds were clear.

Urine.—Special gravity 1028; neutral; albumin ++; sugar 0; microscopically, epithelial and granular casts with an occasional leucocyte.

Blood —White blood cells 27,200; blood culture

Blood.—White blood cells, 27,200; blood culture, Gram + diplococcus; Wassermann test, negative; blood sugar, 0.096 per cent; x-ray of the abdomen was negative

On November 13, 1928, Dr. C. K. P. Henry made the following notes. "Chills and fever continue. The abdomen moves with respiration, but is somewhat prominent above the umbilicus. The veins over the lower abdomen are prominent. Liver dullness is increased, but there is tympany high in the left hypochondrium. There is dullness in the left flank which disappears on change of posture but does not shift to the opposite side. Muscular resistance is increased in the left costo-iliac angle."

On November 15th an exploratory incision, 3½ inches in length, was made over the right upper rectus. The liver was enlarged but normal in colour. The incision was found to be inadequate for further exploration of the upper abdomen and because of the poor condition of the patient the wound was closed. A thoracentesis was negative. An x-ray of the chest was also negative. On November 21st the patient's condition had slightly improved and a barium series was commenced. A duodenal ulcer and hyperperistalsis of the intestine were demonstrated. No special abdominal tenderness was noted nor did the patient at this time complain of abdominal pain. He was taking food a little better and his bowels were moving regularly. On

November 23rd, he suddenly complained of generalized abdominal pain and went into a condition of shock. A transfusion was given, but he failed to rally and died within four hours.

Clinical diagnosis.—Generalized peritonitis arising possibly from a perforated duodenal ulcer; streptococcus septicamia.

Autopsy.—(M. G. H. A-29-336). The peritoneal cavity contained considerable sero-sanguineous fluid. Four feet of the central portion of the ileum were distended and gangrenous and the branches of the superior mesenteric artery supplying this area were thrombosed. The mitral valve showed an old endocarditis, with more recent vegetations. There were septic infarcts in the kidneys and spleen. A streptococcus, in pure culture, was grown from the heart's blood.

Pathological diagnosis.—Thrombosis of the branches of the superior mesenteric artery supplying a portion of the ileum; infarction of the ileum (4 ft. of the central portion); early peritonitis; infarcts of the kidney and spleen; streptococcus septicæmia.

CASE 5*

M. G. H. No. 5802/23, admitted on August 31, 1923, and died on November 20, 1923.

History of illness.—M. F., a female, aged 34 years, was admitted with a diagnosis of Graves' disease, the symptoms dating back two years. Following a prolonged rest in 1921 there had been some improvement, but in March, 1923, the symptoms recurred with greater severity and at this time she first noticed enlargement of her thyroid gland. She again improved somewhat with rest and palliative treatment.

Physical examination showed a rather poorly nourished, nervous, pale, asthenic female, with all the signs of well marked Graves' disease. The gland showed a soft uniform unlargement with definite pulsation, thrill and bruit. There was some ædema of the ankles. The heart showed a slight enlargement, and there was a distinct diastolic shock, as well as a loud systolic murmur at the base. Blood pressure, 190/80; pulse, 120.

Urinalysis negative. Electrocardiograph negative. Red blood cells, 4,280,000; hæmoglobin 70 per cent.

Basal metabolic rate, September 1st, +88, pulse 114; September 11th, +85, pulse 100; October 1st, +24. She was treated by absolute rest and palliatives with satisfactory improvement.

She was re-admitted on November 4, 1923, for operation, after complete rest in the interval; much less nervous and showing a gain in weight of 24 lbs.

Pre-operative basal metabolic rate, November 6th, +20, pulse 96; November 11st, +11, pulse 84.

Operation, November 16th: sub-total thyroidectomy under gas-oxygen anæsthesia and local injection of skin with novocaine.

Post-operative course.—Moderate febrile reaction; maximum temperature, 100.4° F., but auricular fibrillation at times and a pulse range of 136 to 144.

Clinical notes.—November 19th, eighty-two hours after operation, there developed a sudden severe attack of generalized abdominal pain radiating to the back and associated with nausea. An enema was effectual but did not relieve the pain. Later she vomited and became very restless. On November 20th at 2 a.m. she had a recurrence of severe pain over the whole abdomen with radiation to her back. She vomited brownish material. Enemata were not effectual. Severe recurrences of pain took place at 4.30 a.m. and 7 a.m. Rectal temperature 97.4°. At 10 a.m., marked abdominal facies.

Examination of the abdomen showed no distension, tumour, splinting or dullness in the flanks. There was some tenderness over the lower abdomen. In view of the

^{*} This case was previously described by Dr. E. M. Eberts²⁰ of the Montreal General Hospital in his recent monograph on Thyroid Disease. Mesenteric thrombosis occurred as an incidental post-operative complication.

long standing cardiac trouble with fibrillation, embolism of the mesenteric artery was considered as the most likely cause of the condition.

Operation was carried out under gas-oxygen anæsthesia, the abdomen being opened in the midline below the umbilicus. Slate-coloured, distended, small intestine presented. The mesenteric vessels were pulseless. The area of involvement began about 6 inches above the ileo-cæcal valve and extended proximally for a distance of about twelve feet. Resection and end-to-end anastomosis were done. The patient failed to rally from the operation, and died 30 hours later, 48 hours after the onset of the pain.

Clinical diagnosis.—Thrombosis of the superior mesenteric artery; infarction of the small intestine; chronic valvular disease of the heart with more recent vegetations and subsequent embolism of the above mentioned artery; exophthalmic goitre.

Examination of the resected bowel (S-23-1027).—
"The specimen consists of 8 feet of small intestine, together with its mesenteric attachment. The bowel is dark red to chocolate-brown in colour and greatly distended. The serosa is dull and lustreless. The lumen contains considerable old and fresh blood. The superior mesenteric artery and its branches distal to the right colic contain propagating thrombi. These were present even in the finer radicals."

ETIOLOGY

The two common causes of occlusion of the mesenteric arteries are embolism and thrombosis. Generally speaking, while embolism is the more common, it is sometimes difficult to determine which of them is primary. Certainly the majority of cases occur in persons with endocarditis, which suggests primary embolism. Only second to endocarditis as an underlying factor is arteriosclerosis and it is in these cases that doubt most often arises as to whether embolism or thrombosis is primary. Careful investigation usually shows that an embolic fragment of a calcified or ulcerated plaque has been the primary cause of infarction. The occlusion of a mesenteric artery by primary thrombosis on an arteriosclerotic basis does occur, but is much less common. Trotter,9 in his excellent monograph, has stated that embolism is forty times more frequent than thrombosis. The superior mesenteric artery is more often occluded by an embolus than the inferior, because (1) of its larger orifice; (2) it is closer to the heart, and (3) it is given off obliquely, whereas the inferior mesenteric comes off more at a right angle.

Apart from endocarditis and arteriosclerosis a number of other conditions have occasionally given rise to mesenteric occlusion. Among them are carcinomatous emboli and thrombi, Raynaud's disease, polycythæmia, pressure from an aneurysm of the aorta, septic emboli and periarteritis nodosa (a case of which has recently occurred at this hospital). Buerger's disease is

not mentioned as a cause in any of the reported cases, and the clinical diagnosis in our third case was not confirmed at autopsy.

The cases range in age from infancy to 80 years; the average being 45. Males predominate over females in the proportion of three to two.

A number of cases have also been described under the heading of mesenteric thrombosis in which thrombosis of arteries or veins, or both, has been found in association with strangulated hernia, volvolus, etc. In these cases, however, the thrombotic changes are secondary to the mechanical obstruction of the circulation. They are, thus, not properly included under this heading.

PATHOLOGY

Occlusion of the mesenteric arteries or their branches is almost always followed by hæmorrhagic infarction of the intestines, and ultimately, as a rule, by peritonitis. Frequently this results from a perforation, as in one of our cases, but more often by direct extension of infection through the gangrenous intestine.

The mesenteric arteries are not end-arteries anatomically, according to Cohnheim's interpretation, but abundant experimental evidence has been advanced, notably by Litten and others, to show that physiologically they are. The explanation for this has been shown to depend upon two factors. In the first place it has been demonstrated on dogs that an arterial pressure of 300 mm. of mercury is ordinarily necessary to establish a complete collateral circulation for the superior mesenteric by way of the inferior mesenteric. Consequently unless the occlusion is limited to a relatively terminal branch of one of the mesenteric arcades, hæmorrhagic infarction will almost invariably occur. Such minor infarctions do occur and are undoubtedly the cause of various gastro-intestinal symptoms, and attacks of colicky pain, the significance of which is not recognized until later. This is well illustrated in our third case in which there was a remote history of a severe though transient attack of abdominal colic, as well as symptoms of gastric ulcer, and again, some weeks before the final obstruction to the mesenteric artery, the occurrence of thrombotic gangrenous appendicitis. The second factor predisposing to hæmorrhagic infarction is the proven rapidity with which even temporary stasis is followed by extravasation of blood into the surrounding tissues. This, again, is the result of a number of local conditions and various writers have endeavoured to stress one or the other of them. They are as follows:— (1) the reflux of blood in the mesenteric veins due to the positive portal pressure; (2) the lack of tissue support for the mesenteric veins; (3) the sympathetic nervous control which permits rapid dilatation of the veins; (4) the local anatomical arrangement, i.e., the manner in which the arteries and veins pass through the muscularis and muscularis mucosæ, making them liable to occlusion by muscular spasm; (5) the area of capillary bed involved. Probably the combination of these factors varies in the individual case. That extensive collateral circulation, however, does occur occasionally has been demonstrated by nine instances of spontaneous recovery, the patients having subsequently died from other causes. Virchow reported such a case in which the superior mesenteric artery and its branches were found at autopsy to be entirely represented by fibrous cords, the inferior mesenteric being much larger than usual and serving the normal distribution of the superior mesenteric. other cases described showed lesser degrees of a similar condition. Among the notable ones are those of Chiene4 and Karcher.5 In Chiene's case the collateral circulation came from the retroperitoneal arteries. In all such cases it would appear that occlusion must have occurred very gradually. No such case has been found in 9,000 post-mortens at The Montreal General Hospital.

The usual sequence of events in mesenteric arterial occlusion is as follows: (1) primary embolism or thrombosis; (2) immediate stasis of circulation; (3) extravasation of blood and resultant hæmorrhagic infarction; (4) peritonitis with or without the occurrence of a perforation. Intestinal obstruction takes place sooner or later in all cases. Œdema and sloughing of the mucosa occurs early, even in minor infarctions. Mucosal sloughing secondary to small infarctions has been widely supported as the initial lesion which results in peptic and certain other gastro-intestinal ulcers. Occlusion of the inferior mesenteric artery is somewhat less liable to result in infarction, because collateral circulation is more easily established.

Symptomatology

It cannot be said that there is any characteristic clinical picture of occlusion of the mesenteric arteries any more than there is of the veins. Generally speaking, however, the cases in which the artery is involved are much more sudden in onset. The history or presence of endocarditis also aids greatly in the diagnosis. However, all the more recent writers agree with Brady¹¹ when he states that the local clinical picture is for practical purposes indistinguishable from acute intestinal obstruction due to any other cause. The attack usually commences with sudden severe abdominal pain, which is at first colicky, and later becomes more continuous in character and accompanied by marked prostration. This is usually followed, sooner or later, by vomiting which is perhaps not so constant or severe in character as in acute intestinal obstruction from other causes. Melæna, while not always present, is found more often and is much more profuse than in other forms of obstruction of the bowel. However, it is important to come to a decision as to operation before melæna develops, and if better mortality results are to be obtained the only question to be settled is whether or not the abdomen is to be opened. In deciding this question the physical signs are too often of little help. Occasionally a definite mass may be felt, but more frequently the situation is confused by the shifting of the signs and symptoms from one part of the abdomen to another. Not infrequently infarction, gangrene and peritonitis may be well advanced without definite localizing signs. Generally speaking, these cases may be likened to those pitfalls of diagnosis—the cases of partial intestinal obstruction. Probably no other abdominal catastrophe will tax the acuity of the attending staff to a greater extent than mesenteric arterial occlusion. Help in diagnosis which might be obtained from laboratory examinations such as blood chemistry is, more often than not, unobtainable on account of lack of time.

PROGNOSIS

Of the many cases reported less than 40 have recovered and nine of these were spontaneous. It is likely, however, that there will be improvement in the future.

TREATMENT

Surgical intervention should be carried out in all cases as soon as the condition of the patient will permit. Every effort should therefore be made to condition the patient as rapidly as possible for operation. One frequently has to deal with circulatory failure, due in part to the shock of embolism but chiefly to the underlying cardiac lesions. Whether it is better at operation to do immediate resection and anastomosis or be content with evisceration of the involved bowel and a temporary enterostomy will depend on the individual case. Large resections have been successfully performed, as in the case of Bonnot²¹ in which 88 inches of bowel were removed. A serious bar to recovery following resection is the extension of thrombosis in many cases into areas of the mesentery which at operation appear to be normal, as exemplified in case 5.

REFERENCES

- 1. TIEDEMANN, cited by Virchow.
- 2. VIRCHOW, Arch. f. path. Anat., 1847, 1: 332.
- 3. Ibid., Verhandl. d. phys.-med. Gesellsch. in. Wurzb., 1854, 4: 341.
- 4. CHIENE, J. Anat. & Physiol., 1869, 3: 65.
- 5. KARCHER, Cor.-Blatt f. schweiz, Aerzte, 1897, 27: 548.

- KARCHER, Cor. Blatt f. schweiz, Aerzte, 1897, 27: 548.
 LITTEN, Arch. f. path. Anat. u. Physiol., 1875, 63: 289.
 ELLIOT, Ann. Surg., 1895, 21: 9.
 JACKSON, PORTER, AND QUINBY, J. Am. M. Ass., 1904, 42: 1469; 1904, 43: 110 and 183.
 TROTTER, Embolism and Thrombosis of the mesenteric vessels, Camb. Univ. Press, Cambridge, 1913.
 WELCH, Thrombosis and embolism, Allbutt's system of Medicine, 2nd. edit., Macmillan & Co., London, 1909,6: 691, 762.
 BRADY, Arch. Surg., 1923, 6: 151.
 COUNCILMAN, Boston M. & S. J., 1894, 130: 410.

- Brady, Arch. Surg., 1923, 6: 151.
 COUNCILMAN, Boston M. & S. J., 1894, 130: 410.
 SMITH, Calif. & West. Med., 1930, 32: 5, 308.
 PARKER, Canad. M. Ass. J., 1922, 12: 655.
 Hubbard, Clifton Med. Bull., 1928, 14: 90.
 SJOVALL, Acta. Chir. Scandinav., 1927, 61: 577.
 SELBY, Brit. M. J., 1928, 1: 757.
 Reich, Beitr. z. klin. Chir., 1913, 87: 317.
 KLEIN, Surg., Gyn., & Obst., 1921, 33: 385.
 EBERTS, FITZGERALD AND SILVER, Surgical diseases of thyroid gland, Lea & Febiger, Phila., 1929, p. 152.
 BONNOT, Medical Record, 1918, 93: 502.

THE USE OF CONTACT LENSES FOR THE OPTICAL CORRECTION OF CONICAL CORNEA

BY LOUIS KAZDAN,

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CONICAL cornea, one of the classical conditions in ophthalmology, has for many years challenged the ingenuity of the profession for its correction. It is a comparatively rare disease and its underlying cause is unknown. Heredity apparently plays no part, and it is rarely congenital. It usually begins between the ages of twelve and twenty years. There is apparently some inherent weakness of the cornea, which begins to thin out at the centre, and, yielding to the intraocular tension, bulges forward and takes on the appearance of a cone. Both eyes are as a rule involved. At first the thinning is confined to the central portion of the cornea, but as the condition progresses the peripheral portion of the cornea is involved also. The progress of the disease is gradual and for a long time the cornea remains transparent. As a result of the stretching, however, tears occur in Descemet's membrane. Due to this, and the mechanical injury to the protruded cornea, opacities are eventually formed at and near the apex.

The impairment in vision is usually very severe, and is due to the great irregularity of the corneal curvature, and in part to the scarring. Treatment, with a view to retarding the progress of the condition has been of no avail, and the only hope of the profession has been the perfection of some means of restoring vision to the patient through optical correction. Ordinary sphero-cylindrical lenses have been of little use. Other types of optical systems, such as the hyperbolically-curved lenses used by Rahlmann in 1879 and the hydrodiascope of Lohenstein,1 have also not proved practical.

The use of a contact glass in the correction of conical cornea dates back to the efforts of Fick, who was first to devise it in 1888. His glass was clinically inapplicable, however, because the periphery of the contact glass rested on the cornea, and the patients were unable to withstand the irritation for more than a few minutes. In 1908, Mueller, of Wiesbaden, devised a contact glass which offered greater promise of clinical application. It had a flange which rested against the sclera, and supported the corneal segment. The intervening space between the corneal segment of the glass and the cornea was filled with physiological salt solution. The Mueller contact glass was made of blown glass and was, therefore, as a rule, mathematically inaccurate, fragile, and difficult to duplicate. It was, however, a great step forward, and in a few cases brought about marked improvement in vision. The attempts to make a contact glass by grinding met with failure for a long time. Ultimately, however, the Zeiss Optical Works at Jena were successful in perfecting a method for their production which is indeed one of the triumphs of optical science.



Fig. 1

The Zeiss contact glass is a saucer-shaped lens of optical glass which is worn under the eye-lid in contact with the eye ball. optically effective central segment of the contact glass covers the cornea, from which it is separated by a layer of fluid (physiological salt solution). The peripheral portion of the contact glass lies snugly against the sclera. The glass is almost invisible (Fig. 1) when worn and partakes of all the movements of the eye ball, being held against it by surface tension. The corneal segment of the contact glass, together with the fluid between it and the cornea, constitutes a lens the refractive index of which is approximately the same as that of the cornea. The action of the latter is thus practically eliminated. We have in effect replaced the irregular cornea by an artificial one, presenting a regular surface. The contact glass is made from the hardest optical glass, and is quite resistant to the corrosive effect of the tear fluids. The glass selected must fit snugly against the sclera, and should not come into contact with the cornea anywhere. With the test contact glass in place, ordinary spherical lenses are added until maximum vision is obtained. The strength of the added spherical correction, plus or minus, is then incorporated in the contact glass ordered for wear.

It requires time and patience on the part of both oculist and patient until the latter becomes



Fig. 2

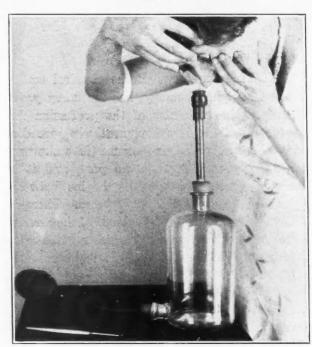


Fig. 3

accustomed to insert and remove the contact glass himself. At first the eye is anæsthetized with one per cent holocaine or butyn and the contact glass left in for only a short period of time. After several trials the use of anæsthesia can be discontinued and the glass allowed to remain for longer periods until it can be worn with comfort for about eight hours at a time. Keeping it in longer than this is inadvisable, as

the fluid behind it becomes cloudy and obscures the vision. In the beginning the eye may react with considerable conjunctival injection, but it gradually becomes accustomed, and after several weeks, providing the glass selected fits properly, the conjunctiva remains pale, and the patient is often hardly aware of its presence in the eye.

For inserting the contact glass, I have used a suction bulb improvised by cutting off the tip of an ordinary rubber bulb syringe and stretching the opening over an open thimble. Over this is then stretched the lower portion of a nursing nipple, the smooth rolled end of which is left to engage the contact glass. (Fig. 2). For the patient's own use, the suction device described by O'Rourke¹¹ is most admirable. This consists of a wash bottle to the outflow neck of which is attached an ordinary hand bulb. The wash bottle is filled with water up to the lower margin of the neck, thus leaving a small air space. A piece of glass tubing six inches long and of small diameter is fitted at one end with a rubber cork. The opposite end is fitted with a piece of rubber gas tube, an inch and a half long and 15 mm. in diameter. The free end of this tube is cupped out so that it may receive the convex surface of the contact glass, and over the free end of the tube is stretched a gumrubber cot. A pin-point perforation is made in the finger cot at its centre. The rubber cork is inserted in the bottle. Application of pressure to the bulb forces air through the hole in the cot. The glass is moistened, and placed in contact with the cot. Release of pressure on the bulb causes it to be held firmly in position by air pressure, until it is inserted behind the lids. It is released by pressing on the bulb.

I have found it of advantage to modify slightly this device, as follows. Instead of glass tubing, which is liable to break and injure the poorly seeing eye, I use metal tubing which serves the same purpose and is safer. Over the upper end is stretched a piece of rubber tubing and in this is inserted an open thimble fitted with the lower part of a nursing nipple, as in the suction bulb described above. This arrangement is simple, permanent, and effective.

The patient retracts his lids as shown in the picture (Fig. 3), and places his eye into the fluid-filled contact glass until it is in contact with the sclera. He then allows the retracted lids to slip over the glass and presses on the

bulb to release it from the suction apparatus. The fluid between the glass and the cornea should be free of air bubbles. To remove the glass a blunt hook is inserted between the glass and the sclera, the lids retracted and the glass drawn forward and out.

H. P., labourer, aged 44. His sight began to fail when he was about 14 years of age. It gradually grew worse until at the age of 20 and since then everything became so blurred that he could not even distinguish a person's face. He had given up all hope of ever seeing clearly again. Examination showed conical cornea in both eyes and left external strabismus. his right eye was about 7/200, and in the left about 4/200.

With contact glasses and added correction, his vision has improved to 20/30 in the right eye, and 20/40 in the left. All objects appear to him clear and well defined. Colours are sharp and he is able to read ordinary newspaper print comfortably. After some practice he is now able to insert and remove the contact lens himself, and he can wear it with comfort all day. Because of his squint only the right eye was corrected, as correcting both eyes causes diplopia.

CASE 2

Miss K. O., aged 38. Vision began to fail at the end of her high school career, and has gradually failed until now everything is extremely blurred. Examination showed conical cornea in both eyes with diffusely scattered dense opacities at the apices. Vision 1/200 in each eye. Contact lenses improve her vision to 20/100 in each eye. Ordinary objects are seen fairly clearly; colour contrasts are sharp, and she can read 4 mm. print With a magnifying lens she can comfortably. typewritten print easily.

Both these patients have for the first time since the onset of their disease been able to see their own features in the mirror and to see the world about them as it really is. The changed outlook on life, the new vistas in the joys of living opened up to these patients, is something which one with the gift of good sight can hardly fathom.

In the use of contact lenses, properly selected, and with care taken to accustom the patient and the patient's eyes to their use we have a practical means of effecting a great improvement in most cases of conical cornea. The two patients reported are to my knowledge the first ones in Canada on whom contact lenses have been used. Their cases are reported in the hope that others similarly afflicted may have the same gratifying results.

BIBLIOGRAPHY

- 1. LOHENSTEIN, Klin. Monatsbl. f. Augenh., 1904, 34: 405.
 2. SIEGRIST, Klin. Monatsbl. f. Augenh., 1916, 58: 400.
 3. LAUBER, Klin. Monatsbl. f. Augenh., 1924, 72: 239.
 4. QURIN, Klin. Monatsbl. f. Augenh., 1927, 79: 656.
 5. SCHEFFELS, Klin. Monatsbl. f. Augenh., March-April, 1924, 74: 500. 74: 509.
- 74: 509.
 6. WEILL, Klin. Monatsbl. f. Augenh., 1916, 57: 126.
 7. HEINE, München. med. Wchnschr., 1930, 77: 6.
 8. Von der Heydt and Gradle, Am. J. Oph., 1930, 13: 867.
 9. Rugg-Gunn, Lancet, 1930, 2: 1067.
 10. Deutch, Klin. Monatsbl. f. Augenh., 1929, 82: 295.
 11. O'ROURKE, Am. J. Oph., 1928, 12: 187.

AMMONIUM PHOSPHATE AS A URINARY ACIDIFIER

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DURING the past year the problem of urinary antisepsis and acidification has been studied in this department in conjunction with the Department of Urology at the Toronto General Hospital. One of the difficulties which arose during the course of this work was that of securing a suitable urinary acidifier which would be effective in lowering the pH of urine excreted, and at the same time be pleasant and easy to take.

Since Hutchison¹ first recommended the use of acid sodium phosphate (1903) as a urinary acidifier, this drug has been used extensively in clinics and by practitioners for this purpose. The acidity of the urine depends upon the balance of the bases and acids of the urine. Although the bicarbonates, amino-acid salts, and proteins contribute to the balance, the chief factor is the relative amounts of disodium hydrogen phosphate, Na₂HPO₄ and the sodium dihydrogen phosphate (acid sodium phosphate) NaH, PO. The excretion of acid sodium phosphate will make the urine more acid, and if there is excess of base, it will lead to the excretion of more disodium phosphate, and this in solution has a pH of more than 7.0., i.e., is still alkaline. Until acid sodium phosphate is excreted the urine will not become acid.

The work of Stockman⁵ and Johnston² has shown that acid sodium phosphate has but a slight and uncertain effect in lowering urinary acidity, unless the urine is alkaline. If acid, the effect is always slight and often does not occur. Our work reported fully in this issue (see page 668) confirms this. Hence we resorted to ammonium benzoate. The ammonium is converted in large part into urea and excreted as such, having no effect on the urinary pH. The benzoic acid is largely transformed hippuric acid and excreted combined with base. If we consider this base to be drawn from disodium phosphate, this will be converted into acid sodium phosphate, making the urine more acid. This salt is effective, but ammonium chloride, whose ammonia undergoes the same change to urea and leaves, theoretically, hydrochloric acid to react with disodium phosphate, leads to the excretion of sodium chloride, a neutral salt, and acid sodium phosphate; hence the urine becomes more acid. monium chloride has more effect than ammonium benzoate. Yet ammonium chloride is not a pleasant drug to take in 20 gr. doses. This suggested that acid ammonium phosphate would equal ammonium chloride in its effect; indeed, theoretically, it should be better, as again the ammonia might be excreted as urea, and thus leave available an amount of phosphoric acid which would react with two disodium phosphates instead of one, as would be the case with acid sodium phosphate or ammonium benzoate or chloride. We noticed that the pH of a solution of acid ammonium phosphate was lower than we expected. Recent work by Neuschlosz and Perez Ibanez4 has explained this result. They have shown that, owing to the difference in dissociation between sodium or potassium phosphates and those of ammonium, an ammonium phosphate buffer mixture always shows a lower pH than an equivalent sodium and potassium one; and they have shown that ammonium phosphates in the urine will give a lower pH than those of sodium. The effect is considerable, about 0.12 pH.

The acid ammonium phosphate used was the primary ammonium phosphate of J. & T. Baker & Co. In the following prescriptions it is very palatable:—

R	Acid Ammonium Phosphate	gr.	xx
	Liquid Extract of Liquorice	m.	vi
	Syrup	3	SS
	Water to	3	ii
Ŗ	Acid Ammonium Phosphate Syrup of Lemon or	gr.	xx
	Syrup of Citric Acid	3	88
	Water to	3	ii

None of those taking the first mixture found it unpleasant, and those who did not understand the nature of the drug volunteered the statement that they felt better and fresher while taking it. Of course, this sometimes occurs with the acid sodium phosphate also. Unfortunately, it cannot be combined with hexamine, as formaldehyde is set free. The effect on urinary acidity equalled what we had obtained with ammonium chloride.

The method used for the five normal individuals was to collect all the day specimens, usually 5 to 6 specimens, and examine them for pH and in some cases for titratable acidity

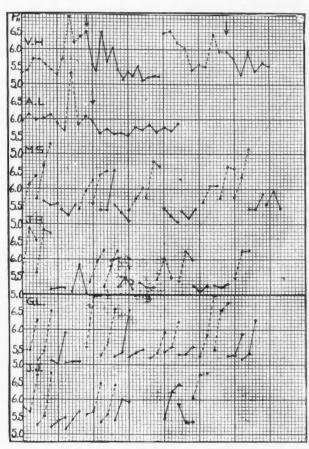


CHART I.—In this chart the periods on acid ammonium phosphate are represented in full lines. The broken lines are periods without the drug.

Curve V.H. represents the pH of every specimen passed two days without, and two days on the drug in each section.

Curve A.L. represents the morning specimen only. Each dot represents a day.

The other curves show only three specimens per diem—after breakfast, after lunch and late afternoon.

against N/10 NaOH. In all cases, the urine was collected and tested for two days before the drug was given; then 20 gr. of the salt were given after each meal and at bedtime for two days; then the drug was discontinued for two more days, and so on, until our series contained about ten days on the drug and ten days off, for each individual case. In the case of the one hospital patient, the early morning urine was used, one specimen per day, as is described in our previous paper.

The irregularity of the pH of urine samples of a person on a normal diet is well shown in the first curve on the chart; and the irregularities of a hospital patient at the same hour on different days are well shown in the first part of curve A.L. (see also Kay3). The same may be seen in the other curves. The general trend in all cases is downwards. The highest points in every case occurred on days when the drug was not taken; and the lowest points were reached when the drug was taken. The drug undoubtedly tended to make the urine more acid and to make the pH more regular. In the two cases where the titratable acidity was measured, it was found to be markedly increased by the drug, in many cases almost doubled. This was much more striking than with acid sodium phosphate.

This drug deserves further study by those who are interested in producing urines of low acidity. As mentioned in the succeeding paper (Scott and Mitchell), the lower the pH the greater the effectiveness of hexamine as a urinary antiseptic. As the drug gives apparently as marked an acidity in the urine as ammonium chloride, and is more pleasant to take in large doses, the author would urge that it be given a trial.

REFERENCES

- 1. Hutchison, Brit. M. J., 1903, 1: 1256.
- 2. Johnston, Edinb. M. J., 1927, 34: 223.
- 3. KAYE, Australian J. Exp. Biol. & Med. Sc., 1929, 6: 187.
- 4. NEUSCHLOSZ AND IBANEZ, Biochem. Zeit., 1931, 232: 106.
- 5. STOCKMAN, Edinb. M. J., 1927, 34: 396.

THE MANTOUX TEST.—The Mantoux test is extremely valuable in the diagnosis of tuberculosis in children. It is not difficult to carry out and is comparatively painless. If care be taken to exclude sources of error, a negative result excludes tuberculous infection and is an extremely valuable finding after measles, whooping cough and broncho-pneumonia, in cases of

chronic cervical adenitis and so-called intestinal indigestion. A strongly positive result in young children suggests active tuberculous disease and usually justifies a bad prognosis. A mild positive result indicates tuberculous infection (not necessarily active) and children showing such a reaction would benefit from open-air treatment and increased prophylactic precautions.—Gaisford, Lancet, March, 1931.

URINARY ACIDIFIERS AND ANTISEPTICS: A CLINICAL STUDY

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IT is not the purpose of this paper to discuss the literature of these subjects at length. Reference thereto will only be made as seems necessary to the elucidation of the results. Nor will details of the technical procedures used be described, as this preliminary paper is intended largely to suggest to the profession certain clinical procedures that have proved of value.

Urinary acidity is largely due to the relative amounts of disodium hydrogen phosphate, Na₂HPO₄, and of sodium acid phosphate, NaH₂PO₄, present in the urine. If the acidity be determined by titration with a solution of caustic soda no true representation of the actual acidity in the modern sense is given, since both the phosphates will combine with sodium hydroxide. By true acidity is meant the concentration of hydrogen ions present in the solution. The concentration of hydrogen ions is usually expressed as the pH of the solution; the higher the pH, the less acid the solution. The urine of normal persons will vary from neutral, with a pH of 7, to acid with a pH of 5.5 to 6.0.

Now it has been shown by DeEds¹ and others that the liberation of formaldehyde from hexamine is more rapid the more acid the urine, and is extremely slow and low in amount in solution above pH 6.0, and much more rapid and complete in solutions between 5.0 and 6.0. The bearing of this will presently be seen. Hexamine is not in itself antiseptic, but only the formal-dehyde which is produced from it.

The urines on which bacteriological studies were made, and of which the pH and titratable acid were measured, were in all cases, save where mentioned, morning specimens drawn with a catheter in women, or freshly voided in the case of men. Sterile catheters were used and the urine was received in sterile flasks which were replugged with sterile cotton wool. The analyses were carried out as soon as possible, usually within three hours. In some cases,

where quantitative estimations of formaldehyde and especially of hippuric and benzoic acid were made, larger specimens were collected.

The bacteria present were identified by us and also checked by the Department of Bacteriology, to whom our thanks are due. Suitable dilutions of the urine were made, mixed with plain agar medium, and plated in the usual way. After incubation for 48 hours, the colonies were counted. The numbers reported are for 1 c.c. of urine. The pH determinations were made with the quinhydrone electrode, save in the cases where the pH exceeded 7.6. The titratable acid was obtained by titrating with N/10 hydroxide solution, using phenolphthalein as an indicator.

The cases, save where mentioned, were patients of the Toronto General Hospital. In all complete physical and urological examinations were made, and no cases were used which could be improved by operative procedures until such had been carried out. These cases were under the constant observation of one of us (D.M.), who was responsible for the specimens provided, and the reports of clinical progress and treatment.

It was decided to ascertain in so far as possible, the effects of changes in urinary acidity on the number of bacteria present before proceeding to the use of antiseptics. In consequence, in a series of cases, after an adequate preliminary period of observation, usually five days or over, with bacterial counts, urinary acidifiers were given.

Acid sodium phosphate was given in 20 gr. doses four times a day, save where mentioned. The work of Stockman⁴ and of Johnston,³ in Edinburgh, has not been given the general recognition that it deserves. These workers, as a result of studies largely on normal persons, pointed out that it was only in cases having alkaline urine that any considerable shift in pH was produced by acid sodium phosphate. In the normal case, with an acid urine, little change

could be effected, though it is true that the normal diurnal increase in pH (so-called alkaline tide) might be decreased. Our observations fully confirm this work. Using merely the morning urine, the change in pH was slight, as may be seen in Chart 1. It will be noted in this and

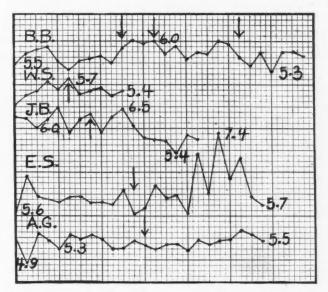


CHART 1.—These curves represent the pH of daily morning specimens of urine. The arrows indicate the point at which acid sodium phosphate medication was begun. In B.B., gr. x, gr. xx and gr. lx were given; in the remainder a dose of gr. xx was given. The numbers represent the pH at the point nearest on the left of the number in each case.

in the other figures that there is a great variation in pH from day to day. This is true of normal individuals also, as is shown by one of us in another paper (in this issue). Even if the pH of each specimen of urine passed is taken, there is no regularity from day to day, and one can only judge of the effect of a urinary acidifier by the general trend of the results. In only one of these cases (J.B.) was there a distinct downward trend, which may also be seen in B.B. with the larger doses, and possibly in W.S.; while in E.S. and A.G. the trend is more or less distinctly to the alkaline side. The titratable acidity was also irregular, and not necessarily in harmony with the changes in pH. In no case was there any change in the bacterial count.

Ammonium benzoate is readily absorbed and well taken in the following mixture:—

R.	Ammonii Benzoatis	gr. xx
	Ext. Glycyrrhizæ Liq.	m. xv
	Syrupi	3 i
	Acres ad	7 99

Within the body the ammonium radicle becomes changed to urea, while the benzoic acid is conjugated in the kidney with glycine to pro-

duce hippuric acid, which is excreted as a sodium salt, thus decreasing the amount of disodium phosphate and increasing the acidity of the urine. Free benzoic acid was found in the urine in all these cases, even occurring as early as the second day. Specimens showed usually 0.015 mg. per 100 c.c.; in one case 0.07. The highest concentration would then be 1 part of benzoic acid in 1,300,000 parts of urine, a dilution which could not be expected to have much effect. Chart 2.

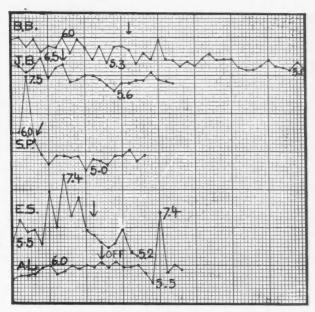


CHART 2.—These curves represent the pH of daily morning specimens of urine. The arrows indicate the point at which ammonium benzoate medication was begun. In curve A.L., ammonium benzoate was given, but at the point indicated by the arrow, the patient was taken off the drug.

As will be seen, there is a slight downward trend in B.B., with a greater uniformity of pH, and also in J.B.; in S.P. and E.S., a distinct fall. In A.L. no preceding normal period is shown, but a rise and greater irregularity after the ammonium benzoate was stopped. Even acid urines such as those of B.B., 5.5 to 6.0, or of J.B., 6.0 or 5.8, became more acid.

The change in bacterial count was inappreciable in all cases save one, A.T., not shown in curve form, but reported subsequently as Case 2, a pyelitis case with a predominant staphylococcus infection. In this case, of a month and a half's duration, which had been under observation for only two days, the bacterial count was 21,000, and the pH. 5.51 before treatment. At the end of six days the urine was sterile on occasion, although the pH had only fallen from 5.1 to 5.37. Whether this was entirely due to

the change in acidity, or some effect of the benzoate, or fortuitous, the authors are unable to decide. The pH then rose, possibly owing to the patient not receiving benzoate for a day, but the count rose only to 35. She was then given hexamine in addition to the benzoate, and the urine became sterile and remained so. A fall of bacterial count was seen in one other staphylococcus infection (B.B.). In the colon infections no such effect was produced.

Ammonium chloride was given in doses of 20 gr. four times daily, in the following mixture taken well diluted:—

R	Ammonii Chloridi	gr.	xx
	Ext. Glycyrrhizæ Liq.	m.	X
	Syrupi	3	SS
	Aquæ ad	3	ii

As in the case of the benzoate, the ammonium radicle is transformed into urea, leaving available chlor-ions which, by uniting with base, decrease not only the pH of the urine, but that of the blood stream slightly. It will be seen by Chart 3 that the increase in acidity or fall in pH was more marked than with the other drugs. In all these cases there was a more marked effect

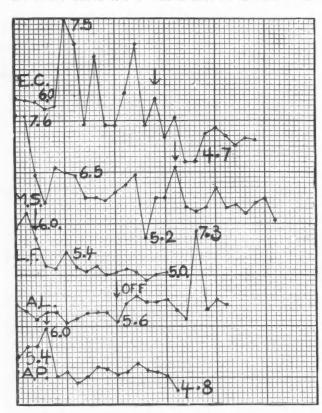


CHART 3.—These curves represent the pH of daily morning specimens of urine. The arrows indicate the point at which ammonium chloride medication was begun. In curve A.L., the patient had been taking ammonium chloride and the arrow indicates the point at which medication was stopped.

than with the other salts; as compared with them it is very marked in cases E.C., A.P., M.F., and definite in M.S. In A.L., where no preceding normal is shown, the marked irregularity and the general upward trend in pH is seen after the omission of the drug. Again, it will be noted that even distinctly acid urines, such as A.P., 5.5 to 6.0, were made more acid.

There was, in those cases in which the pH fell most markedly, or reached low values, a slight improvement in bacterial count, but even in those kept for ten days or more on the drug alone no great change was observed.

Having thus obtained some indication of the effect of changing the pH of the urine alone, we passed to the use of hexamine (urotropin), and in view of the studies of DeEds, we chose ammonium chloride, as he had shown that the lower the pH the more rapidly the hexamine was hydrolysed and the greater the amount of formaldehyde obtained. Hexamine can be given in a mixture with ammonium chloride and the following mixture, well diluted, was readily taken:—

R	Hexaminæ	gr.	x
	Ammonii Chloridi	gr.	XX
	Ext. Glycyrrhizæ Liq.	m.	X
	Syrupi	3	SS
	Aquæ ad	3	ii

In the first two cases ammonium benzoate was used with hexamine.

CASE 1

B. B., a female, aged 27, with cystitis, a pure sureus infection. She was admitted on July 20th; S. aureus infection. discharged July 27th; re-admitted October 8th, unimproved. Normal pyelograms. Diagnosis-chronic cystitis, with acne vulgaris; low sugar tolerance. with alkalies, bladder irrigations and rest; no improve-No treatment from October 26th to November 14th. The pH varied from 5.3 to 5.8 or 5.6. Breterial counts were from 450 to 68,000. Given acid sodium phosphate in doses of 10-20-60 q.i.d. from November December 5th. The pH was irregular, but Bacterial counts had a general trend down-14th to December 5th. wards to about 1,000 or less. Ammon. Benzoate, 20 gr. q.i.d., given from December 5th to December 15th; the pH fell to about 5.2 to 5.5. Bacterial counts were not reduced, possibly on account of a sugar tolerance test. December 15th; hexamine 5 gr. q.i.d. was added On December 31st the count was 33, falling in next four days to sterile. January 7th; following sugar tolerance test the count increased to about 100. The patient then left hospital.

CASE 2

A. T., a female, aged 18, admitted on December 28th, pregnant five months, with eclampsia; delivered. On January 16th she was transferred to the genitourinary service, with a fever and pus in urine. Diagnosis—pyelitis of the right kidney (S. aureus; some B. coli). Alkaline treatment was stopped on January 18th. On January 19th and 20th the pH 5.4 and 5.6; bacterial count, 21,000. She was given ammonium

benzoate on January 22nd, 20 gr. q.i.d. The urine was sterile on January 26th. A count of 8 on January 28th. Hexamine, 5 gr., was added on January 28th; count 35. On January 30th the urine was sterile and remained so.

CASE 3

E. C., female, aged 72, with recurrent acute cystitis; two previous attacks had been observed. She was admitted on January 23rd, and the diagnosis of cystitis (B. coli) was made; pH 5.9; count 31 to 68 million. Acid sodium phosphate, 20 gr. was given q.i.d. for four days with slight improvement. On January 30th ammonium benzoate was given for 20 days; pH not lower; the bacterial count fell to 100. On February 24th there was an exacerbation to 5 million or more. She was given ammonium chloride with no improvement. On March 3rd the count was 150 million. Hexamine was added. The urine was sterile on March 10th to 13th and remained sterile. On May 2nd it was still sterile.

CASE 4

A. P., a female, aged 22, was admitted on March 4th. Diagnosis—right-sided pyelonephritis (B. coli). Temperature was 104°. Alkaline treatment was given till March 6th; pH 5.4; count 22 million. Acid sodium phosphate was given. The patient felt better and was discharged. She was re-admitted on March 25th, with the same diagnosis; pH 5.6; count 27 million. She was given ammonium chloride and hexamine; the pH fell to 5.2 to 4.7. The urine was sterile on April 16th (21 days), and remained sterile. The patient was discharged on April 23rd. When seen again on May 17th, there were no symptoms; the urine was sterile.

CASE 5

E. P., a female, aged 51, an old cystitis case, of 1½ years' duration, (B. coli). Out-patient on March 24th; pH 5.185; count 10 million, ammonium chloride and hexamine were given; on March 28th pH 4.9; urine sterile. On March 31st, April 7th, April 24th, and May 1st, she was seen again. The urine was sterile on each occasion.

CASE 6

M. B., a female, aged 26, an out-patient on March 24th with subacute cystitis of three weeks' duration. (Colon infection). She was given pot. citrate and sodium bicarbonate. On March 24th, pH 5.5; count 3 million. On March 30th ammonium chloride and hexamine were given. April 1st, pH 6.1; count 354,000. April 11th, pH 5.7; urine sterile. When seen again on April 14th, 21st and 28th, the pH was about 5.1; urine sterile.

CASE 7

G. G., a female, aged 20. She had been in hospital for 4 weeks, discharged, and returned in four days; admitted February 28th; duration of her trouble 2 months. She was in a high fever. The diagnosis was cystitis and pyelitis. No pus came from either kidney, B. coli found. She was given alkaline treatment. On March 18th, she was taken off treatment until March 27th, when she was given ammonium chloride and hexamine. On March 30th, pH 5.4; urine sterile. On April 1st and 6th, pH was 5.1 and 5.8; urine sterile. Discharged. She was examined again on April 14th; the urine was sterile.

In these seven cases sterility was attained. Unfortunately, in the first case the patient left the hospital with an infected urine, though the count was very low, and had treatment been continued there seems reason to believe that a cure would have been obtained.

In the following, positive effects were not obtained. It will be seen that in some cases this was due to lack of cooperation or opportunity.

CASE 8

J. B., male, aged 45, with enlarged prostate, hydroureters, cystitis and pyelitis. Prostatectomy was done in December, 1929. Convalescence was complicated by acute pyelitis and epididymitis. On December 30, 1930, he came as an out-patient. Diagnosis—chronic cystitis and pyelonephritis (colon infection). He was put on acid sodium phosphate, and, later, ammonium benzoate. The count was 24 million and on January 2nd hexamine was added. On January 7th, the count was 5 million. The treatment was irregular until March 13th; count 300,000; at no examination during this period was the pH lower than 5.4, usually about 5.8. No ammonium chloride was given.

CASE 9

S. P., female, aged 35. On December 16, 1930, the diagnosis was mild pyelonephritis and cystitis, with kinked right ureter. On December 27th a ureteroplasty was done. On January 8th an acute pyelonephritis was manifest. By January 18th the acute phase had subsided; B. coli infection; count 300 million; pH 6.1. On January 20th ammonium benzoate, 10 gr., was given. On January 24th, 20 gr.; no improvement was noted. The pH fell to about 5.4; slight fever. On January 30th hexamine was added. The count fell (highest 8 million, lowest 10,000; irregular). She was discharged on February 14th, but came under observation as an out-patient; no improvement. On March 30th she was given ammonium chloride and hexamine continued; no improvement, but the count on May 30th was 4 million. Treatment very irregular; she often did not report till she had been days without medicine.

CASE 10

A. C., female, aged 21, admitted on February 1, 1931, with right-sided pyelonephritis; pregnant 7 months. Renal drainage was given with lavage and alkalies. She was discharged and re-admitted on March 5th. Diagnosis—as before (colon infection). On March 7th, the pH was 5.8; count 100 million. On March 8th, acid sodium phosphate was given. On March 13th, the pH was 6.3; count 3.5 million. She was discharged, and returned on March 18th as an out-patient. Ammonium chloride and hexamine were given; pH 6.8; count 31 million. On March 24th, the pH was 5.6; count 86 million. The findings were irregular until April 25th; no improvement. Her medicine was taken irregularly.

CASE 11

M. S., female, aged 20, admitted January 13th. Acute pyelitis and cystitis (B. coli) with 7 months' pregnancy. Ureteral catheters were left in for 2 days; large doses of alkali; temperature 104°. January 26th, fever slight. Acid sodium phosphate given; the pH was 7.6; count 400 million. January 30th, ammon. benzoate; pH 6.6; count 400 million. February 20th, ammonium chloride; pH 6.1; count 350 million. The fever persisted. Treatment continued till March 17th, when it was discontinued; pH 5.6; count, 340 million. On March 21st, she was delivered. March 30th, pH 5.6; count 204 million. May 2nd, out-patient; pH 5.1; count 7 million. Ammonium chloride and hexamine were given. May 9th, pH 4.8; count, 119,000. She discontinued treatment, and when seen on May 30th, the pH was 5.1, and the count 30 million.

CASE 12

A. L., female, aged 45, admitted June, 1930. Diagnosis — disseminated sclerosis. An incontinent bladder was catheterized January 9, 1931. Fever, and pus in urine (bilateral pyelonephritis). February 4th,

colon infection. The average pH for two weeks was 5.4; count 100 million. February 27th, acid sodium phosphate given; average pH 5.4; count 30 million. March 12th, ammonium benzoate given; average pH 5.8; count 40 March 15th, hexamine was added; pH and million. count unchanged. March 28th, a retention catheter was inserted. Ammonium chloride and hexamine given; pH 5.7; counts 100 to 2 million, very irregular. April 10th, the treatment was changed to hexyl-resorcinol, 10 gr. q.i.d.; the pH rose to 6.1; the count was about 30 million. April 25th, acid ammonium phosphate, 20 gr. q.i.d. added; the pH fell to an average of 5.6; count 300 million. May 11th to May 23rd, she was given a bicarbonate mixture; the pH rose to 8.0; count 400 million. May 27th, the catheter was changed; pH 5.8; count 300 million. Ammonium chloride, 20 gr., ammon. acid phosphate, 20 gr., and hexamine 10 gr. were given q.i.d. May 28th, pH 5.5; count 4 million. June 2nd, pH 5.6; count 10 million. The catheter was changed and the following specimen showed pH 5.6, count 500,000.

CASE 13

E. W., female, aged 28, admitted April 24, 1931. Diagnosis—acute pyelitis of pregnancy, of 3 days' duration. April 25th, a catheter was passed to the right kidney. Mercurochrome lavage. April 28th, the catheter was out. May 2nd, pH 5.7; count 350 million. Colon infection. Ammonium chloride and hexamine to May 19th; pH 7.0; count 100 million. Discharged.

CASE 14

L. F., female, aged 47, admitted April 3, 1931. Diagnosis—ruptured appendix, general peritonitis. Abscesses drained, one by posterior colpotomy. She developed pyuria on April 10th. May 2nd, pH 6.2; count 100 million. May 4th, ammonium chloride and hexamine administered. May 5th, pH 5.2; count 148 million. She was on treatment till June 2nd; the pH had fallen to 5.0 and 4.9; count 6 million. Discharged.

As will be seen, of these cases, No. 8 was never given ammonium chloride, and consequently the pH of his urine never fell to a low point. His treatment was also irregular, but the bacterial count was reduced. Cases 9 and 10 were also out-patients, in whom treatment was irregular, as they often did not report till they had been some days without medicine. In case 4, treatment had reduced the count in a week from 7 million to 119,000, when the patient discontinued treatment. In case 13, the treatment for 17 days seemed to be without effect, but for some reason the urinary pH always remained high. In case 14, in spite of an adequate fall in pH, while the count fell from 148 million to 6 million, and treatment for 33 days, a cure was not effected.

The amount of free formaldehyde found in these urines by the method of Hanzlik and Collins,² varied considerably, most cases showing 0.002 g. per 100 c.c.; but in some cases the amount rose to 0.004 and in one case 0.01 per cent. This means a dilution of 1 in 50,000 of urine to 1 in 10,000. This, however, does not necessarily form an indication of the amount of

formaldehyde freed, but only that uncombined by protein at the time of estimation. Even these dilutions are within the ranges which would be expected to have some effect.

The striking effects obtained by the administration of ammonium chloride and hexamine have led to a change in the post-operative treatment of prostatectomy. These cases are now placed upon ammonium chloride and hexamine immediately after operation, with the result that the urine usually becomes acid to litmus and clear, and there is less of the distressing odour and excoriation of the skin under the dressing. The wounds also close more rapidly. As an example we might quote the following case.

CASE 15

J. B., male, aged 62. Diagnosis—enlarged prostate, vesical calculus; infected bladder; urine strongly alkaline and foul. Suprapubic prostatectomy, the operation wound passed through the site of a previous bladder operation and was complicated by cicatrized tissue. The patient was put on ammonium chloride and hexamine immediately after operation. The urine next day was acid to litmus and became clear. The wound healed in 3½ weeks, when the man was discharged with a clear urine. Bacterial examination was not made.

We might also refer briefly to three other cases which were not adequately studied, as they were private patients of our colleague, Dr. R. A. McComb, to whom our thanks are due for permission to refer to them.

CASE 16

J. L., male, aged 50. Diagnosis—recurrent prostatitis and bilateral pyelonephritis. Cloudy, foul urine for 10 years. He was given ammonium chloride and hexamine; the urine was clear in four days. He is still on treatment. The urine was clear on June 8th.

CASE 17

E. O., female, aged 35, 5½ months pregnant. Frequency of urination 1½ years. Diagnosis—tuberculous right kidney, pyuria. Acid-fast bacilli were found in a smear from the urine. Frequency every 15 minutes; pH 7.4; culture negative. Ammonium chloride and hexamine were given. Organism still present. Frequency improved (evacuations per day 4, per night 2). The pH was 5.9 to 5.7.

CASE 18

W. R., male, aged 55. Diagnosis—tuberculous right kidney; tuberculous bladder. Frequency every 3 hours night and day. May, 1930, nephrectomy. May 14th, a complaint of a hæmaturia for 2½ weeks persistently; clots 1 cm. diameter were passed. The urine was alkaline to litmus and contained phosphate precipitate. The patient was given ammonium chloride and hexamine, the frequency remaining the same. The hæmaturia ceased May 15th, and has not re-appeared. June 8th, the urine was acid to litmus; no precipitate on May 15th.

In regard to this last case we would only point out that it is known that hæmorrhage from the bladder occurs more readily when the urine is alkaline, probably due to a secondary infective process, and hence the justification for the palliative treatment used. In regard to the second case also, we do not suggest a real improvement but a palliative relief, and call attention to what we have noted in other cases, that with an acid urine frequency is often decreased.

In regard to case 12, one of our unsuccessful cases, we wish to call attention to what appears to be an undoubted difficulty that it presented. The patient had a retention catheter. It will be noted that a specimen taken before the catheter was changed had a count of 10 million, and the first specimen collected after changing, a count of half a million. Undoubtedly the slow flow through the catheter enabled a great increase in the bacterial count. Now, the formaldehyde in acting as an antiseptic unites with bacterial protein, and, consequently, the greater the number of bacteria, the faster it is used up and becomes ineffective; furthermore, there is a limit to the amount of formaldehyde that can be produced, partly by the amount of hexamine that can be, or was given, and partly on account of the slow rate of its hydrolysis at a pH over 5.

It used to be taught that the urine from an infected bladder was alkaline. This may be so if the growth of certain of the bacteria which may be present changes its reaction, but if the urine be freshly voided it will be seen that in most of our cases the morning urine is definitely on the acid side, so much so that it is but little affected by acid sodium phosphate, whose use as a urinary acidifier should be abandoned. Ammonium benzoate is undoubtedly better in this effect, and also, as our work has confirmed, some free benzoic acid may be produced. This occurred in all cases. This may contribute to a decrease in bacterial growth. As may be seen

from case 2, this drug alone was sufficient to make the urine sterile, or almost so, in a case of staphylococcus infection.

It will be further evident that the use of ammonium chloride and hexamine has not in all cases proved successful, in spite of the fact that in cases 11, 12 and 14 the pH fell adequately, and an examination of the urine showed the presence of amounts of formaldehyde, which in other cases was sufficient to produce sterility. Improvement was undoubtedly shown in 11 and 14 as well as in the seven cases cured.

In some cases the patients on ammonium chloride and hexamine were troubled with bladder irritation and some pain. Fortunately, encouragement, and a statement that an improvement was occurring, led them to persist. We believe that such cases, carefully watched, might be aided by the use of hyoscyamus, codeine, or acetylsalicylic acid, or phenacetin to decrease the pain.

We hope that this study will be further prosecuted and extended, but feel that the success achieved in some of these cases of known history and long standing justifies us in suggesting that ammonium chloride or other urinary acidifiers of more effectiveness than acid sodium phosphate or even ammonium benzoate might well be given a trial in cases of urinary infection, when it is the intention to give hexamine.

The authors wish to thank Dr. W. W. Jones, Head of the Department of Urology, for permission to use the cases and to report their findings. They also wish to thank Prof. V. E. Henderson for constant advice and criticism, and for the facilities of the Department of Pharmacology.

REFERENCES

- 1. DEEDS, Arch. Int. Med., 1924, 34: 511.
- 2. HANZLIK AND COLLINS, J. Biol. Chem., 1915, 35: 221.
- 3. JOHNSTON, Edinb. M. J., 1927, 34: 223.
- 4. STOCKMAN, Edinb. M. J., 1927, 34: 396.

CULTIVATION OF VACCINIA VIRUS FROM HUMAN LYMPH.—E. G. Nauck and E. Paschen report the cultivation in vitro of the vaccinia virus from a specimen of human lymph. The lymph, which came from the 62nd arm-to-arm passage, was put up in tissue culture with spleen or testicle, heparinized plasma, and tissue extract. Incubation and subcultivation were performed under the usual conditions. Titrations were made on the third, fourth, and sixth passages, using the rabbit's cornea, and it was found that multiplication of the virus had occurred. This appears to be the first time that direct cultivation from human lymph has been performed—Zentralbl. f. Bakteriol., 1931, p. 312.

THE VALUE OF GOOD POSTURE can hardly be over-It is, however, something that can only be attained as a by-product of healthful, well balanced The savage has it; the wild animal has it; the healthy child has it. Like character, to which it is closely related, it is attained by indirect meansattention to nutrition, vision and general physical It is an aggressive thing rather than development. a passive; it is dynamic rather than static, a living pulsating condition rather than a frozen, stiff state; it is grace and efficiency rather than pose; it is an unconscious adaptation to surrounding conditions rather than a studied attempt to appear handsome .- Dr. Thurman B. Rice in Hygeia.

THE CLINICAL SIGNIFICANCE OF THE DORSAL ROOTS IN SPINAL ANÆSTHESIA*

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THE purpose of this paper is to correlate some of the known facts of the anatomy and physiology of one division of the sensory pathway, so that one can formulate on the basis of these facts a working hypothesis to explain some of the physiological disturbances produced by spinal anæsthesia. The interpretations submitted here have been deduced from clinical experience only, not physiological experiment. This type of anæsthesia does not lend itself readily to animal experimentation as there is a great divergence between the highly organized nervous system of man and that of the lower vertebrates.

Since spinal anæsthesia is usually produced by the introduction of a neurotropic drug into the subarachnoid space, generally in the lower lumbar region, its local and immediate actions must necessarily be confined within this space, which in this region is filled by the roots of the spinal nerves that go to make up the cauda equina. Therefore, if we wish to study the specific action of this neurotropic drug, it is important that we should know the anatomy of the structures in the subarachnoid cavity. It is not necessary to discuss the anatomy of the cord or of the ventral nerve roots, because we can explain all the physiological phenomena of spinal anæsthesia by the action of the drug on the dorsal roots alone. It is true that this view is not held by the majority of writers on this subject. Labat¹ states that "the sensory and motor roots, being apart from each other, the action is greater on the motor fibres than when injecting the mixed nerve trunks, even by the endoneural method, outside the spine. Motor paralysis is the natural consequence of intraspinal block." This point of view is also held by that brilliant exponent of spinal anæsthesia, Babcock.² I shall attempt to show that this statement of Labat cannot be sustained on either pharmacological or physiological grounds.

upper neurone. To this complexity of the sensory system we can attribute its vulnerability to the action of all types of anæsthetic drugs. Hitzig³ and Bernstein⁴ have established the fact that everywhere in the central nervous system the motor mechanism is particularly resistant to narcosis. Therefore, it is not surprising that local anæsthetic drugs of the benzoyl group, of which novocaine is deservedly the most popular, affects almost exclusively the sensory elements of the nervous system. Independent experiments by Koch,⁵ Santesson⁶ and Dixon⁷ proved this many years ago. The pharmacotropic action of novocaine for sensory elements is so pronounced that its conduct may be likened to that of a vital stain, picking out sensory fibres and avoiding motor filaments. The selective affinity for certain nerve elements is a feature common to many other neurotropic drugs, such as adrenalin, acetylcholine, nicotine, curare and so on. It would be reasonable to postulate from the pharmacodynamic evidence of the elective affinity of the cocaine group for sensory nerve tissues that the brunt of the action of novocaine in the subarachnoid cavity would be on the From this standpoint we are dorsal roots. justified in assuming that the tendency of novocaine would be that of blocking the posterior nerve roots and permitting conduction through the anterior nerve roots.

The sensory neurone system is much more complex than is the motor neurone system. In

its simplest form it consists of at least four

neurones, while the simpler motor neurone sys-

tem is made up of only two—a lower and an

This statement may still appear, on the surface, rather paradoxical, for it is known that spinal anæsthesia does produce various degrees of so-called motor paralysis, which is especially marked in the lower limbs. However, let us analyze this type of paralysis from the standpoint of the physiology of the afferent nervous system. We have learned from the physiologists how tremendously complicated muscular move-

^{*}Read before the Section of Anæsthesia, Academy of Medicine, Toronto, April 27, 1931.

ment really is, and how, in order to coordinate these movements, there must be a constant stream of informative impulses flowing along the posterior roots to the portion of the brain which initiates locomotion. The significance of this important general principle, that the essential basis of all purposeful and effective motor activity is to be found in accurate sensory information, seems to have been overlooked by many authors on spinal anæsthesia. The part played by afferent impressions in the coordination of muscular movement was emphasized several years ago by Starling.8 was the first to point out that experimental section proximal to the ganglia of all the posterior nerve roots supplying a limb produces a functional, though not an actual, paralysis of the muscles of that limb. Furthermore, it has been shown that postural activity of muscles (muscle tone) depends primarily on the integrity of the posterior nerve roots. If these impulses from the corresponding muscles are not received, loss of tone results; the muscles become flabby and the limb can be placed in unnatural positions, and excessive movement is permitted at the joints without producing discomfort. Obviously, in Starling's experiment there develops anæsthesia of the entire limb for all forms of sensation, because the sensory impulses from the periphery are cut off from the spinal cord. This description of some of the results following experimental section of the posterior nerve roots is applicable to the picture produced by spinal anæsthesia, except that the latter procedure produces only a temporary section of these same fibres. It is apparent, therefore, that the presence of paralysis of the lower limbs in spinal anæsthesia is not in any sense of the word indicative that the motor roots have been affected by the drug.

It is not essential in this paper to consider the form and function of the spinal cord, because we have no tangible evidence that spinal anæsthesia has any direct influence on this important structure. It may appear on casual examination that this form of anæsthesia produces a physiological section of the cord. A careful neurological investigation will show, however, a radicular type of block.

In order to understand spinal anæsthesia we must have a clear conception of the minute anatomy of the dorsal nerve roots proximal to

the ganglia. I hope to show that a careful scrutiny of the histology of this region of the dorsal nerve roots will elucidate the selectivity of novocaine when introduced intrathecally. The accurate researches of Ranson have done much to clarify the anatomy of the dorsal nerve In 1912, Ranson⁹ modified the Cajal silver technique in such a way as to produce a differential stain of non-myelinated fibres and applied to the method the term "pyridine silver technique". As a result of this procedure, he has been able to demonstrate the existence of a large number of non-myelinated fibres in the dorsal roots of spinal nerves. For many years the prevalent view has been that both the dorsal and ventral roots of the spinal nerves are made up exclusively of myelinated fibres. As to the function of the myelin sheath in medullated nerve fibres very little is known. Many speculations have been indulged in with regard to its function but practically nothing that is certain can be said upon this point. It has been supposed by some to act as a sort of insulation, preventing contact between neighbouring axiscylinders and thus insuring better conduction. But against this view it may be urged that we have no proof that the non-medullated fibres do not conduct equally as well. There is, however, some evidence that this sheath plays an important part in the chemical process involved in the act of nervous conduction. Furthermore, the fibres which possess a medullary sheath are more resistant to defective blood supply and toxic agents. It is probable that the myelin sheath serves as a source of nutrition to the enclosed axis-cylinder, which, in the greater part of its course is far removed from its trophic centre, namely, the cell from which it is an outgrowth. This so-called trophic function of the myelin sheath has a certain basis in the fact that the myelin sheath is larger in those fibres that have the longest course, the size of the sheath in fact increasing with that of the axis-cylinder. In describing the dorsal nerve roots, Ranson notes that the fibres that are not myelinated are very small and also have a relatively short course. This, surely, fits in with the idea of the probable trophic function of the myelin sheath.

Although Woollard¹⁰ states that Ranson's observations have not won general acceptance on either anatomical or physiological grounds, his work, however, has been confirmed by Ingvar¹¹

and accepted by Hauptman.12 Ranson thinks that these non-myelinated fibres can only be shown by his modified stain and, therefore, most anatomists have failed to see them. Also there has naturally been reluctance to accept a radical change like this in fundamental ideas. However, the evidence which he presents is very convincing when viewed from the spinal anæsthetic standpoint. He describes the intrathecal part of the dorsal roots in the following manner:-"The central end of a dorsal root breaks up into many rootlets or filaments which enter the spinal cord in linear order along the line of the posterior lateral sulcus. As it enters the cord each filament can be seen to separate into a larger medial and a much smaller lateral division. The fibres of the medial division are of relatively large calibre and run over the tip of the posterior column into the posterior funiculus. The fibres of the lateral division are fine and enter a small fascicle which lies along the apex of the posterior column, the fasciculus dorsolateralis or tract of Lissauer. Very soon after their entrance into the cord each dorsal root fibre divides in the manner of a Y into a larger ascending and shorter descending branch". He maintains that the fibres of the lateral division of the dorsal roots are all very fine and that the majority are non-myelinated. Those of the medial division, on the other hand, are practically all myelinated.

Having considered this conception of the morphology of the dorsal roots, it will now be advisable to discuss the variety of sensory impulses carried by these different types of nerve In 1822 the French physiologist Magendie gave to the world his fundamental dictum that the dorsal roots of the spinal nerves carry all forms of sensation. In 1900, Sherrington¹³ classified the filaments of the dorsal roots, from a functional point of view, into three broad groups. In this classification he designates those dorsal fibres carrying impulses from the viscera as interoceptive and subdivides the somatic afferent fibres into exteroceptive and proprioceptive groups. The exteroceptive fibres carry impulses from the surface of the body. These fibres, therefore, are actuated exclusively by external stimuli. The impulses produced in this way are carried by these special fibres to the spinal cord and then relayed to the cerebral

cortex, where they are interpreted as the sensation of heat, cold, pain and touch.

The proprioceptive fibres carry nerve impulses which on reaching the central nervous system give information concerning the tension of the muscles and the relative position of various parts of the body. For the most part, however, these impulses do not rise into consciousness, but serve for the subconscious control of muscular activity. There are, therefore, two main groups of afferent somatic impressions that eventually excite sensation, namely, those that come from the skin and those that originate in the deeper or proprioceptive structures of the The much greater importance of the latter in determining the activity and reactions of the body must not be forgotten; a limb with cutaneous anæsthesia may be quite a useful member, but complete loss of all forms of deep sensations would make it worthless to the individual.

It may be noted here that the observations on which Head and his co-workers attempted to subdivide cutaneous sensations into protopathic and epicritic groups have no bearing on the problem of sensory dissociation in spinal block. Thus, all forms of touch, whether crude or precise, all forms of temperature, whether extremes of heat and cold or intermediate grades of temperatures, and all forms of pain are conveyed by exteroceptive fibres. These exteroceptive fibres having a very short course terminate in the dorsal horns around cells whose axones go to make up the spinothalamic fibres in the opposite ventro-lateral column. The coarse medullated fibres of the mesial division of the dorsal roots carry proprioceptive impulses. ascend without interruption through the dorsal columns to the medulla oblongata.

We are now in a position to develop a coherent idea of the anatomy of sensation as applied to the central processes of the primary sensory neurones on their way to the posterior lateral sulcus of the spinal medulla. Ranson assumes that the small non-medullated fibres, previously described, carry exteroceptive impulses out of which the sensation of heat, cold, pain and some forms of touch are elaborated. His conclusions have been confirmed recently by Gasser, Bishop and Erlanger, ¹⁴ using the cathode ray oscillograph.

Physiological investigations by these observers have shown that the action currents in the dorsal roots are very heterogeneous, whereas in the ventral roots they are more or less homogeneous. Analyses of these waves have shown that the dorsal roots are composed of at least four different types of fibres (alpha, beta, gamma, delta). The ventral roots are made up only of alpha fibres. These four components of the dorsal roots are associated with different functions as shown by their histological and physiological characteristics. Thus the alpha fibres have the largest cross section, the greatest velocity of nervous impulses, the lowest threshold to stimulation, and the shortest absolute and relative refractory periods, whilst the beta, gamma and delta fibres have progressively diameters, lower velocities, higher thresholds, and larger refractory periods. This natural group of the velocities of impulse propagation in these different types of axones falls into accord with the observations of Lapique and his colleagues on the varying chronaxies of nerve trunks. Lovatt Evans¹⁹ has suggested that motor impulses to muscles, sensory impressions, and afferent depressor impulses belong to the alpha class, the beta sensory impressions evoke respiratory reflexes, and the gamma, pressor reflexes. The delta fibres correspond to the fine non-medullated fibres of the dorsal roots which Ranson has been able to stain by his silver pyridine method. Since the four types of fibres have different morphological and functional characteristics, it would be safe to postulate that their behaviour under the influence of novocaine would also differ.

Having considered in detail some of the known anatomical and physiological data of the areas affected by the intrathecal dose of novocaine we are now able to understand and interpret some of the clinical findings observed in routine spinal block. The physical and functional differences in the posterior root fibres afford a very practical explanation of the dissociation of sensation produced by spinal anæsthesia. On a purely physical basis it would not be difficult to account for the exquisite sensitivity of the exteroceptive fibres to very dilute solutions of novocaine, because of the small size of the fibres and the absence of the insulating coat of myelin, whereas the larger and well insulated fibres of the proprioceptive group should offer greater re-

sistance to the effect of very dilute solutions. This assumption can be verified readily by giving a small dose of novocaine intraspinally. For example, if 40 mg. of novocaine dissolved in 4 c.c. of distilled water be slowly introduced intrathecally at the level of the 4th lumbar interspace only the exteroceptive and interoceptive fibres below the level of the 12th thoracic segment will be blocked. Within five minutes analgesia and thermoanæsthesia will develop in the area supplied by these segments, with no appreciable disturbance of deep sensibility and hence no paralysis or ataxia of the limbs, the tendon reflexes not being abolished. In this experiment the concentration of the drug is not sufficient to cut off all the afferent impulses and, therefore, we get the type of dissociated anæsthesia as seen in a typical case of syringomelia. However, if 160 mg. of novocaine dissolved in one c.c. of distilled water be administered in the same manner a different condition will exist. Complete anæsthesia and paralysis of the lower half of the body supervene. There is a zone of analgesia and thermoanæsthesia above the area of complete anæsthesia. In this case we obtain a complete block in the region where the drug was first introduced and a partial block where dilution has occurred. In this way the relative safety of high spinal anæsthesia can be explained. The cutting off of the exteroceptive and some of the interoceptive impulses does not break the reflex arc, and hence there is no interruption of function of the affected segments. If the proprioceptive impulses are also blocked we get the usual effect of complete section of the posterior roots, viz., paralysis, ataxia, and anæsthesia.

As a result of the tremendous increase in the use of spinal anæsthesia in the past five years, the literature, especially on this continent, has been flooded with articles on this subject. Consequently, it is rather difficult for the novice to differentiate between the worthless and useful literature. Although the outstanding contributions of Babcock, Labat and Koster¹⁵ have not had much to do with this increase in popularity it is to them that the serious student of this subject must turn. While Koster is relatively arrecent convert to this method, he has, by his original laboratory experiments, supported by a relatively large personal experience, done much to stimulate an interest in the physiologi-

cal side of spinal block. His revision of some of the older functional conceptions has changed the aspect of this subject. Nevertheless, some of his conclusions are open to criticism.

Koster's explanation of the absence of serious cardiac and respiratory impairment in high spinal anæsthesia is based upon the following assumption, namely, that the property of excitability of nerve fibres is more resistant to the action of the benzoyl group than the conductivity of these nerve fibres. Various workers have shown that where, by progressive action of a narcotic, a stretch of nerve has just failed to conduct to the muscle an impulse generated at the central end of the nerve, strong stimuli applied within the narcotised area will still provoke a contraction, especially if applied at the peripheral part of the narcotised stretch. This appears to support the view that conductivity of nerve fibre is more easily affected by anæsthetic drugs than the excitability factor. However, Kato¹⁶ and Forbes¹⁷ independently, have shown that this apparent difference between conductivity and excitability is dependent upon the fact that very strong stimuli can spread far along the nerve, sometimes 30 mm., so that in the above experiments such a stimulus can often affect portions of the nerve outside the chamber. When mechanical stimuli are used instead of electrical ones, the response fails simultaneously to stimuli above the chamber and at all points within it. It seems unlikely that any hypothesis based upon physiological experiments would be sound, as the interpretation of these is so controversial. Therefore, Koster's statement" 'That spinal anæsthesia for surgery of the head, neck and thorax is relatively safe because it is possible to have anæsthetic action to the point of interruption of sensory impulses in nerve fibre and yet be far from a complete depression of excitability of nerve cell", is not supported by the very experimental work from which he draws his analogy. In my opinion, high spinal anæsthesia owes its safety to a low introduction of a concentrated solution of novocaine which, when it reaches the upper nerve roots, becomes so dilute that it is only able to affect the small non-myelinated exteroceptive and interoceptive fibres of the upper dorsal roots. Personal observations from a number of high spinal anæsthesias have demonstrated that in the head, neck and thorax the sensory loss is of the dissociated type as found in syringomyelia, that is, pain and thermic sense are lost, deep sensibility is retained, while in the abdomen, pelvis and lower extremities there is a complete loss of all forms of sensation. There is in high spinal anæsthesia an interruption of the exteroceptive and interoceptive impulses in the upper third of the body while in the lower two-thirds there is an interruption of the proprioceptive as well as of the exteroceptive and interoceptive impulses. In other words there is analgesia and thermoanæsthesia in the upper third and complete anæsthesia and muscular relaxation in the lower two-thirds of the body.

Let us now consider a more difficult part of the subject, namely, the arrangement of the afferent neurones of the involuntary nervous system. The knowledge of this part of the involuntary nervous system is still very meagre. Anatomical studies show that the visceral afferent fibres are chiefly medullated and of varying size, with an admixture of a considerable number of non-myelinated fibres, all of which have their cell stations in the dorsal root ganglia. From the ganglia central processes are sent into the spinal gray matter.

In describing the physiology of spinal block most authors ignore the afferent side of the autonomic system, stressing only the supposed effect of the drug upon the white rami communicantes. It is interesting to note here that anatomically the white rami are not strictly in the subarachnoid space, although the fibres that go to make up part of the white rami are, but these fibres have not been given any special anatomical designation, being known only as preganglionic efferent fibres. Hence it would be more precise not to use the term white rami in describing the effect of novocaine on the sympathetic nervous system. I feel that we can explain all the sympathetic effects of spinal block by the theory that the drug acts only on the afferent side of the autonomic nervous sys-There is reason to believe that under normal conditions the autonomic fibres are always excited reflexly, although normally we receive no conscious sensations from most of our The bladder and the rectum are exceptions to this rule, because at various intervals we receive information concerning the state of tension in these organs. The afferent impulses from the viscera are chiefly expended in reflexly affecting the activity of various involuntary structures such as the blood vessels, glands and smooth muscle fibres. If these afferent impulses are cut off it must follow that the sympathetic system would be paralyzed. Anatomically, it is known that most of these afferent fibres are non-medullated while those of the efferent side of the autonomic group, namely, the preganglionic fibres that go to make up the white rami, are all medullated. It is not difficult to assume that novocaine attacks by preference these non-medullated fibres and in this way breaks the reflex arc of the sympathetic nervous system. It would be beyond the scope of this paper to discuss in detail the physiological derangements produced by interfering with the sympathetic reflex arc. This temporary disorganization of the autonomic nervous system is one of the disconcerting features of spinal block. The removal of sympathetic control, as Cannon¹⁸ has shown in his sympathectomized animal experiments, certainly places the circulatory and respiratory mechanisms at a disadvantage. We can, therefore, say that the modern trend of the exhibition of sympathomimetic drugs such as adrenalin and ephedrin, in an attempt to reinforce the depressed sympathecoadrenalin system, is based probably upon sound physiological principles.

CONCLUSIONS

- 1. That all the disturbances produced in this form of anæsthesia can be explained by the effect of the drug on the afferent side of the nervous system.
- 2. That there is anatomical, physiological, pharmacological and clinical evidence in support of this view.
- 3. That spinal anæsthesia is a pure, posterior, radicular block of variable intensity.

REFERENCES

- 1. LABAT, Regional Anæsthesia, Saunders, Phila., 1928, p. 456.
 2. BABCOCK, Text. of Surgery, Saunders, Phila., 1928, p. 562.
 3. HITZIG, Arch. Anat. Physiology, 1873, 40: 402.
 4. BERNSTEIN, Moleshott's Unters., 1870, 10: 280.
 5. KOCH, Zentralb. klin. Med., 1886, 7: 793.
 6. SANTESSON, Festschrift für Hammarstein, 1906, Pt. 15, p. 341

- SANTESSON, Festschrift für Hammarstein, 1906, Pt. 15, p. 341.
 DIXON, Physiol., 1905, 32: 87.
 STARLING, Principles of Human Physiology, Lea & Febiger, Phila., 1930, p. 345.
 RINSON, Personal Communication, Jan. 19, 1931. Anatomy of the Nervous System, Saunders, Phila., 1928, p. 95.
 WOOLLARD, Recent Advances in Anatomy, Macmillan, New York, 1927, p. 253.
 INGVAR, Acta. Med. Scandinavica, 1926, 65: 645.
 HAUPTMAN, Zeitschr. f. d. ges. Neurol., 1930, 125: 107.
 SHERRINGTON, The Integrative Action of the Nervous System, Scribner, N.Y., 1906, p. 231.
 GASSER, BISHOP AND ERLANGER, Am. J. Physiol., 1924. 63: 496.

- 14. GASSER, BI 63: 496.

- KOSTER, Am. J. Surgery, 1929, 5: 554.
 KATO AND TERRUCHI, J. Physiol., 1927, 64: 193.
 DAVIS, FORBES, BRUNSWICK AND HOPKINS, Am. J. Physiol.,
- 1926, 66: 448.

 18. Cannon, The Lancet, 1930, 1: 1109.

 19. Evans, Recent Advances in Physiology, Macmillan, New York, 1930, p. 184.

MALARIA AND THE ANOPHELES MOSQUITO IN CANADA

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ANADIAN physicians are in general inclined to believe that malaria cannot be, and indeed never has been, indigenous in Canada. It is the intention of this paper to show that on the contrary the probability is that malaria has been prevalent in at least the southern parts of Canada, and that there exists no apparent reason why under suitable conditions it should not reappear. To most practising physicians it comes as a surprise when their entomological friends show them Canadian-caught specimens of mosquitoes of the genus Anopheles which are known to be important malaria vectors in other parts of the world. This is a rather unfortunate state of affairs as it breeds a false sense of security, but it is difficult to prevent, as insect records are usually published in entomological periodicals not readily accessible to members of the medical profession. Historically, there is a large amount of data, which cannot be lightly dismissed, indicating that malaria or ague has been endemic in some parts of Canada.

Among the earliest records we have of disease in Canada are the Jesuit Relations. In these mention is made of the fact that members of the Order often suffered from ague and similar afflictions while travelling through the St. Lawrence valley and while carrying out their mission in the vicinity of Lake Huron. following excerpt, while not referring specifically to malaria, is rather suggestive.

"But these great forests were guarded during the summer by little winged dragons,-I mean innumerable legions of mosquitoes and gnats, all very thirsty for a blood that they had never tasted; we were compelled to give way to them during the night, and to sleep on the rocks, on the shore of a lake exposed to the air, to the wind, and frequently to the rain.

More than 48 of our people fell sick. We had to lodge under rocks where we had so little room that we lay almost in a heap, one upon another. While one was burning in the heat of fever another shivered with cold. . . .''

Another reference of a similar type is found in Governor Simcoe's papers. Mention is there made of a disease which prevailed among the troops in southern Ontario, prostrating them but not producing many fatalities. This disease occurred during the summer and autumn, disappearing in the winter. No symptoms are described, and it is simply called a fever but it is somewhat suggestive that its appearance coincided with the period of maximum abundance of *Anopheles* mosquitoes.

John MacTaggart, an engineer who worked on the Rideau Canal, has given us more definite information in his book on Canada. He describes in detail in the following extract the symptoms of a disease called in his time malaria or miasma.

"The malaria of this dreadful place (Cranberry Marsh) was the chief cause in my opinion for putting a stop to the progress of the public works in the warm weather of 1828; hundreds of labourers and mechanics were laid down with sickness, many of whom never rose again. The fever and ague of Canada I am told are different from those of other countries; they generally come on with an attack of bilious fever, dreadful vomiting, pains in the back and loins, general After being in this debility, loss of appetite. . . state for eight or ten days, the yellow jaundice is likely to ensue and then fits of trembling-these come on some time in the afternoon, mostly with all. For two or three hours before they arrive we feel so cold that nothing can warm us; the greatest heat that can be applied is perfectly unfelt—the skin gets dry, and then the shaking begins. Our very bones ache, teeth chatter, and the ribs are sore, continuing thus in great agony for about an hour and a half; we then commonly have a vomit, the trembling ends, and a profuse sweat ensues, which lasts for two hours longer. This over, we find that the malady has run one of its rounds, and start out of bed in a feeble state, sometimes unable to stand and entirely dependent on our friends (if we have any) to lift us on to some seat or other.

"This is the prevalent disorder; sometimes it proves fatal, but not generally so by any means. . . Those who have had it once will most likely have a touch of it every year. . . . The sulphate of quinine, a preparation from bark, is what the doctors administer for the cure of this wearisome distemper; it seems a very potent medicine but being very dear, poor people are at a loss to procure it."

This description of symptoms is practically identical with the symptoms given for malaria in the eleventh edition of Osler's Principles and Practice of Medicine. The fact that quinine was practically a specific cure removes any possibility of doubt as to the identity of the disease.

The Canada Farmer of 1864 gives careful directions for the prevention of malaria in swampy districts, leading one to believe that in

some of the farming districts at least malaria was prevalent among the inhabitants. In 1870 an entomologist who was collecting at North Douro, Ont. stated that he was prevented from continuing his work by an attack of ague which was common in that district at the time. An authoritative work published in Edinburgh in 1857, called "North America, Its Agriculture and Climate," records that the inhabitants of a village on the borders of Lake Erie near the Welland Canal contracted ague every year. From less authoritative sources it is reported that John Ogilvy and General Porter, the British and American boundary commissioners, respectively, contracted malaria while passing through the St. Clair River flats in 1819 and that while the American general recovered, Ogilvy died. Since Ogilvy was the stronger willed member of the commission the result was a great loss to Canada in territory, it being thought that he would not have agreed to the boundary line as it was finally settled.

These references to ague or malaria are typical of the many which are scattered throughout the early literature on Canada. The excerpts presented above leave practically no doubt that malaria was present in Canada in endemic form during the first half of the last century and probably before that time.

It will now be necessary to leave the historical aspect of the question and to discuss the present state of malaria in Canada. A brief account of the Anopheles mosquitoes found in Canada and their life history here will be essential at this point. There are in Canada four known species of Anopheles mosquitoes which are able to breed and hold their own, despite the severe climatic conditions. The recorded species are Anopheles maculipennis, A. quadrimaculatus, A. punctipennis and A. walkeri. The first two species mentioned are well known as the most important malaria carriers in Europe and North America. The third species is a less important vector, while it is not known whether A, walkeri can transmit the Plasmodium or not.

As it is frequently convenient to know whether a given adult mosquito is an *Anopheles*, and if so, to which species it belongs, the following scheme for the determination of the Canadian species will be useful. There are two simple "catch" characters which, although not scientific, will readily determine whether a specimen

caught in Canada belongs to the genus Anopheles. The first of these applies to both sexes. It is that the Anopheles mosquitoes are the only mosquitoes commonly seen having spotted wings, all those belonging to other genera being clear winged. The second character applies only to females, which does not limit its use greatly as it is the female which is generally seen, for she alone comes to suck blood, the male living solely upon the nectar of flowers. In the case of specimens which are not taken biting the female mosquitoes of any genera may be differentiated from the males by the fact that they have simple antennæ while the antennæ of the males are macroscopically plumose. The actual character is the length of the palpi; in the female Anopheles the palpi are as long as or longer than the proboscis while in the females of all other genera the palpi are shorter than the proboscis. The scientific criterion of the genus is that all members of it have a rounded scutellum, a character which may be easily seen under the low power of a microscope, or even with a fairly powerful hand lens. The species can be readily identified by running them through the following key, which is modified from Dyar.

The Anopheles larvæ can be readily identified when alive by the fact that they are the only mosquito larvæ which lie horizontally on the surface of the water and which when disturbed dart across the surface of the water rather than swim to the bottom of the pool. Owing to this habit these larvæ are easily detected in any water body they may be breeding in.

The breeding places favoured by the Anopheles mosquitoes in Canada are much the same as those in which they are found in other parts of the world. These may be classified as artificial permanent water-bodies and as natural permanent water-bodies. Under the former group come such places as ornamental pools and lakes, irrigation ditches, and water barrels which are never allowed to dry out. Natural perman-

ent water-bodies include the edges of slowly moving streams, lakes, and large swamps. order to prove satisfactory breeding places, they must all fulfill the following conditions. First, there must be an adequate supply of food for the larvæ. This entails the presence of certain yeasts, small protozoa and algæ, decaying organic matter, and, according to some work carried out recently in Brisbane, the maintenance of a definite concentration of nitrites and nitrates in solution in the water. In the second place there must be no chance of the larvæ becoming isolated in rapidly drying pools by the lowering of the water level. In the third and last place there must be relatively few predaceous enemies present, or else sufficient floating debris and vegetation to enable the larvæ to escape from them. The chief enemies of the mosquito larvæ are fish, salamander larvæ, dragon-fly larvæ, aquatic hemiptera and hydræ. Even in pools which are well stocked with these predators sufficient Anopheles mosquitoes invariably mature to cause considerable annoyance to the inhabitants of the surrounding district, so that such natural control factors cannot be considered an adequate protection.

At the height of the summer the life cycle of the Anopheles mosquito in eastern Canada is about three weeks, while in the cooler weather prevailing during the spring and fall a longer period is necessary for the completion of the cycle. Owing to the overlapping of generations it is very difficult to determine the exact number of broods occurring during one season, but it is probable that in eastern Canada there are five or six. The winter is passed in the adult stage. These adults hibernate in warm and sheltered places, preferring stables and farm outhouses in rural districts and frequently living in cellars in urban areas. With the advent of spring these adults deposit their eggs in suitable locations and by the end of May or the early part of June the first brood of adults emerges and immediately proceeds to lay its eggs. Brood follows brood until the early part of November when cold weather forces the adults to seek shelter for the winter.

Owing to the great importance of the presence of *Anopheles* mosquitoes in a district, the following list of localities where the various species of *Anopheles* have been collected in Canada will be useful.

Anopheles maculipennis.-

Specimens have been captured at:-

PLACE PROVINCE

Quebec Hemmingford; Montreal; Gatineau

Point; Norway Bay.

Ontario Ottawa; Guelph; Little Current

River; Nagagami River, Seventh

Portage; Kenora.

Manitoba Aweme; Treesbank.

Revelstoke; Chilliwack; Nicomen British Columbia

Island; Oliver; Fraser River Valley, (lower part); Kamloops.

Hootalinqua; Valley of Mayo Yukon Territory River.

Dyar gives its distribution in Canada as "British Columbia eastward to the Atlantic''.

Anopheles quadrimaculatus.

Specimens have been captured at:-

PROVINCE PLACE

Hemmingford; Montreal. Quebec Ontario St. Catharines; Jordan.

British Columbia Oliver.

Anopheles punctipennis.

Specimens have been captured at:-

PROVINCE PLACE

Quebec Hemmingford; Montreal; Norway

Bay.

Ontario Ottawa; Winona; Jordan; Guelph;

Algonquin Park; Toronto.

New Brunswick Fredericton.

Nanaimo; Duncans; Wellington; Mission; Yarrow; Ladner; Hope; British Columbia

Mission; Fraser River Valley, (lower part).

Dyar gives the distribution of this species as "Southern Canada and at both coast lines".

Anopheles walkeri .-

Specimens have been captured at:-

PROVINCE PLACE Quebec Hemmingford.

Ottawa; Lake Simcoe. Ontario Dyar gives the distribution of this species as eastern Canada.

It will be noted that many of the above localities are the same for all these species and this is because it is only in these places that any collecting for mosquitoes has been done. We are as yet ignorant of the mosquito fauna of the greater part of the country. The above list is as complete as it has been possible to make it with the resources at the author's disposal, but it doubtless contains many gaps which can only be filled by a careful systematic survey of the mosquito fauna of the whole country. A survey of this type would probably reveal the presence of at least one and probably more species of Anopheles mosquitoes in every province in Canada. Even from the few localities given it can be seen that these mosquitoes have a widespread distribution in Canada. When it is also stated that specimens have been captured from February 27th until November 20th in various parts of the country the importance of the situation becomes apparent.

Before considering the present state of malaria in Canada it will be apposite to observe what has occurred in other countries where malaria has been or is now rife. During the late eighteenth and early nineteenth centuries malaria was proving a great scourge to the northern countries of Europe, such as England, Scotland, Denmark, Sweden, and Germany, where it was present in endemic form. With the advent of drainage a marked decrease was seen in the prevalence of malaria. Probably the best known example of this is the draining of the fens of England with the elimination of malaria from the districts of Cambridgeshire, Lincolnshire, and Romney Marsh in Kent. That drainage is not the only cause of the decrease of malaria is shown by its disappearance from areas where little or no drainage work has been performed. Many reasons have been suggested to account for the disappearance of malaria in such districts, but none have proved really satisfactory, and there is at present much uncertainty about the matter. A frequently accepted suggestion is that the number of Anopheles mosquitoes has been reduced to below the point at which they can successfully carry malaria. This is somewhat invalidated by the fact that during 1917 there were 231 cases of malaria in England which had been contracted indigenously after the arrival of malarious troops in that country. France had a similar experience with about 258 indigenous cases during the same year. At the present time in Canada a survey kindly made for me by the Public Health Officers of the various provinces showed that no cases of malaria contracted in Canada were on record.

As a result of our development of the country there are many breeding places for Anopheles mosquitoes scattered about. Among the more important of these are bodies of fishless water, such as pools in deserted quarries, ditches along railway embankments, and abandoned excavations. Water barrels are also excellent breeding places for Anopheles maculipennis; one barrel in the Ottawa district contained at least thirty larvæ and it was by no means the only infestation in that particular locality. In British Columbia the irrigation ditches are in many places a prolific source of anopheline mosquitoes. Owing to the number of these breeding places, together with the natural ones which are always present, a considerable number of adult anopheline mosquitoes are found in many localities. The writer has been bitten in broad daylight by six Anopheles mosquitoes in one hour while within a hundred yards of an expensive residential area of a fairly large town. At night the inhabitants are driven indoors almost before the sun has set, in such places. It has been proved by Welch and King that from the time the temperature rises above freezing till it falls below it again the Plasmodium can live and develop in the mosquito, completing its life cycle without difficulty. Since this is the case, it might be well to consider the question of the introduction of malaria by immigrants and others, for there is no reason why the migration to Canada of large numbers of immigrants from southern Europe, where malaria is endemic, should not act as a source of infection for others. In this connection, the advent of malarious patients to Canada seeking cures, and the recent use of malaria in our larger centres for the treatment of general paresis must be borne in mind.

SUMMARY

- 1. Historical evidence shows that malaria was endemic in Canada in the late eighteenth and early nineteenth centuries.
- 2. The widespread distribution of three malaria-carrying mosquitoes in Canada requires consideration from a Public Health standpoint.
- 3. A key for determining the Canadian species of Anopheles mosquitoes.
- 4. The known distribution of these four species of mosquitoes and a brief sketch of their life history and breeding places in Canada.
 - 5. The present status of malaria in Canada.

In conclusion, I wish to acknowledge the assistance I have received from Dr. J. J. Heagerty, of the Department of Pensions and National Health, Ottawa, and from Mr. C. R. Twinn, of the Entomological Branch, Ottawa.

BIBLIOGRAPHY

- A more extensive discussion of the subject from entomological viewpoint will be found in the entomological following literature:
- HOWARD, DYAR AND KNAB, The Mosquitoes of North and Central America, Carnegie Institute, Washington, 1917, 4 vols.

- MATHESON, Handbook of the Mosquitoes of North America, Thomas, Springfield, 1930, p. 268.
 TWINN, Canad. Ent., March, 1931, 63: 51.
 DYAR, Trans. Roy. Can. Inst., Pt. 1, 1921, p. 13.
 HEARLE, Mosquitoes of the Lower Fraser Valley, British Columbia, National Research Council, Ottawa, 1926, p. 94

SPINAL ANÆSTHESIA FOR SURGERY ABOVE THE DIAPHRAGM

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IT is assumed that those who read this article are familiar with spinal anæsthesia applied below the diaphragm.

The anæsthetic used.—We dissolve 200 milligrams of novocaine in 1 c.c. of doubly distilled water. We make up 150 to 200 c.c. of solution at one time in an Erlenmeyer flask and use it from day to day. I believe novocaine in this strength makes an antiseptic solution, but we take the further precaution of boiling it for three minutes in the flask.. We have used this solution for three or four weeks without any apparent loss in its anæsthetic potency.

Lumbar puncture.—We have used the second, third and fourth lumbar interspaces for lumbar puncture, but now we use the third lumbar interspace almost entirely for high spinal anæsthesia. I believe the height of anæsthesia produced depends very little on the site selected. It depends on the dilution with spinal fluid, the rate of injection, and to some extent on the position of the patient while being injected.

Dosage and dilution.—For high spinal anæsthesia we have been using from 0.6 c.c. (120 mg. of novocaine) to 1.8 c.c. (360 mg.) of the solution mentioned above. A Luer-lok syringe is We first draw the required amount of novocaine solution into the syringe. Then when the spinal puncture is made we connect the syringe and draw up sufficient spinal fluid to dilute the novocaine solution to 6 or 10 c.c. The amount of anæsthetic and the dilution used depend on the age of the patient and the calculated time required for the operation.

Position of the patient.—We have the patient lying on his side on the table, with the head down and the body on an incline of about 20°. When the anæsthetic is given the patient is then placed in whatever position is required for the operation so long as his head is well below the diaphragm.

The time required for anæsthesia.—For operations between the diaphragm and the shoulders we find it necessary to wait longer for the anæsthetic to produce anæsthesia than for those below the diaphragm. For operations on the head and neck the period of waiting is still longer. The time required to produce anæsthesia in different patients varies considerably. An occasional patient required a few drops of chloroform to allay his fear and produce sleep, even though he had previously had morphine, but when once quieted he required no further anæsthetic

I will now mention briefly a few of the cases we have done under the high spinal technique.

CASE 1

The first case I wish to mention was one in which we amputated the left leg below the knee. The spinal anæsthetic was given by the ordinary method used for low anæsthesia. One hour after the operation was completed the patient was still asleep and could not be wakened by pinching or slapping his face. His jaw was lax, as in the case of ordinary chloroform or ether anæsthesia. His blood pressure, pulse and respirations were normal. In due time he came out of his anæsthesia quite normally. This case occurred before we attempted doing any operations above the diaphragm under spinal anæsthesia but it drew my attention to the possibility of doing such.

CASE 2

An adult male. We used 1.8 c.c. of solution diluted to 10 c.c. with spinal fluid. The patient had a large fibro-cartilaginous tumour which grew from the left inferior turbinate and hung suspended in the nasopharynx. It could be seen through the mouth protruding below the soft palate and causing the soft palate to I first thought that the tumour was a large nasal polypus and expected it would be an easy matter to remove it with a snare. After breaking several snares in attempting to cut its base I discovered it was a solid outgrowth from the inferior turbinate. Thereupon I clipped off the turbinate and removed it and the tumour through the mouth. One and one-half hours was spent in operating, yet the man had no pain. He was quite conscious could spit out blood and mucus and make any movements required of him. This was our first case under high spinal anæsthesia.

CASE 3

A boy, 15 years of age. We used 1 c.c. of solution and diluted to 8 c.c. with spinal fluid. A hare-lip was repaired and the patient was sleeping when we finished.

CASE 4

An adult female. We used 1.6 c.c. of solution diluted to 10 c.c. with spinal fluid. A flap of skin was transplanted from the forehead to the upper eyelid, to correct an ectropion.

CASE 5

For many radical breast amputations for carcinoma we used 1.6 c.c. of the solution diluted to 8 or 9 c.c. with spinal fluid.

CASE 6

A girl, 12 years of age. We used 1 c.c. of solution diluted to 7 c.c. with spinal fluid. Sequestrotomy of the right humerus. The sequestrum consisted of the whole shaft of the humerus. The patient went to sleep during operation.

CASE 7

An adult male. We used 1.8 c.c. of the solution diluted to 10 c.c. with spinal fluid. Dissection of a large right branchial cyst was done and a diseased right tonsil was removed.

CASE 8

We have dissected the superficial and deep glands of the neck in a few cases. We used 1.8 c.c. of the solution diluted to 10 c.c. with spinal fluid.

CASE 9

We have dissected a parotid sinus just below and in front of the right ear. This was caused by a bullet having passed through the head, with its exit through the parotid.

CASE 10

One mastoid operation.

CASE 11

A dissection of buried tonsils in a girl 20 years of age. She inhaled no blood and was able to spit out blood at will. She felt no pain.

CASE 12

A boy, 12 years of age. Tonsillectomy. He was very much frightened, and we had to give him just enough chloroform to produce stupor before we could begin to operate. He then went to sleep and slept throughout the operation and for an hour afterwards. Adenoids were also removed.

CASE 13

Our head operating room nurse. He was quite nervous. We were able to remove his tonsils by guillotine. The right one required two stitches to stop the bleeding. He inhaled no blood and was able to clear his throat at will. He said he had no pain, but could feel a tugging sensation. After the injection had been given about three minutes he complained that he felt slight difficulty in breathing. Nothing abnormal could be noticed and the sensation passed away in two or three minutes.

We gave no morphia preceding any of the tonsillectomies. One important advantage is that there is very little likelihood of the patient inspiring blood or pus during tonsillectomy if spinal anæsthesia is used.

CASE 14

Several rib resections.

CASE 15

The only case so far that we were unable to operate upon under spinal anæsthesia was the enucleation of an eye in an adult male. Though we waited for half an hour for the anæsthesia to take effect we had to give a general anæsthetic. Whether that was a peculiarity of that one patient or whether the eye is not anæsthetized by the spinal method we do not know. So far no other enucleation case has turned up.

Another case we had will illustrate another advantage of spinal anæsthesia.

CASE 16

He was an adult male with cancer of the tongue. The growth was too painful to permit of proper examination. We thought it was confined to one side of the tongue and told him we thought we could give him considerable relief by removing half the tongue. He wished to have this done. We gave him a high spinal injection

and after a thorough examination found that the growth had perforated the septum and invaded the other side. We then told him that there was no use doing anything unless we removed the whole tongue. After discussing the pros and cons with him right there he decided not to have it done. I believe that had he had a general anæsthetic he would now be minus his tongue and we might possibly be up for malpractice.

PRESSURES IN THE STOMACH*

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A KNOWLEDGE of pressures and pressure changes in the alimentary tract and in the abdominal cavity is essential to a proper understanding of many of the normal processes of digestion and intestinal absorption. It is also of great value in the study of gastro-intestinal symptoms, which are due to disturbances of the normal processes. Further, the subject is of importance in connection with other functions, such as the circulation of blood, the secretion of urine, the flow of lymph, and peritoneal absorption. The present paper gives the results of an investigation into the pressures existing in the fundus of the human stomach.

REVIEW OF THE LITERATURE

Intra-gastric pressures in man. — Schreiber⁸ passed tubes into men's stomachs, and showed that pressure changes occur with respiration. Sometimes the pressure was subatmospheric. In 1887 von Pfungen⁵ measured the pressure in the stomach of a boy with a gastric fistula. He found that as he moved the balloon closer to the pyloric sphincter the pressure increased. The maximum pressures obtained were 120 to 130 millimetres of mercury. Moritz4 had normal men swallow balloons. He found that although pressures in the antrum reached as much as 50 cm. of water, the values in the fundus were very low. In a man sitting the pressure varied from 2 to 16 cm. of water. Voluntary contraction of the abdominal muscles greatly increased the pressure, in one instance to 330 cm. of water. He found the pressure in the fundus to vary with posture, and believed that the principal cause of this variation was the weight of the viscera. Quiet inspiration raised the pressure Kelling² found that pressure was independent of filling, and that the stomach relaxed reflexly on feeding. The pressure in the stomachs of sitting subjects varied from 4 to 8 cm. of water. Subatmospheric pressures were demonstrated (1896) when the subject stood upright.

Intra-gastric pressures in animals.—In experiments on dogs, Reprev⁷ found subatmospheric pressures to be the rule. Sherrington⁹ found a pressure of 4 or 5 cm. of water in the stomach of a dog with the abdomen opened.

Intra-peritoneal pressures.—In patients with ascites Quincke⁶ showed that the pressure changed with the phase of respiration, and that it fell considerably on removing the fluid. In some instances he observed increased secretion of urine and a diminution of ædema of the lower limbs following the removal of the fluid, and ascribed these changes to relief of pressure on veins and capillaries. Reprev⁷ found the intraperitoneal pressures in dogs to be less than 3 cm. of water, and in the region of the stomach they were subatmospheric. Emerson¹ found that normally the pressure was positive in cats, dogs,

by 4 to 12 cm. of water. Since the pressure in the fundus was much lower than that in the pyloric portion, the fundus could not force the food into the antrum. Liquids entered the antrum by gravity, and hence the fundus acted as a sorting apparatus. On the subject trying to inspire with a closed glottis, a subatmospheric pressure of as much as 6 cm. of water was produced. A normal man drank 400 c.c. of cold milk, and the pressure fell 3 cm. of water. In a patient with ascites the pressure in the stomach was 22 cm. of water, and in the abdominal cavity was the same. On removal of 15 litres of fluid, the pressure in the stomach was 4 cm. of water.

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rabbits and calves. Keppich³ demonstrated subatmospheric pressures almost invariably in men and dogs under local or general anæsthesia. Wagoner¹⁰ stated that the intra-peritoneal pressure was subatmospheric before birth, during life, and after death. He experimented with many animals, conscious, anæsthetized, and dead. He found that 82 per cent of cadavers gave subatmospheric pressure readings, and that the greater the emaciation the lower the absolute pressure.

Метнор

In the investigation of pressures in the fundus of the stomach the following method was employed.

An ordinary duodenal tube, such as is used in fractional test meals, was punctured by a small punch about 0.5 centimetres from its distal end. (This served to prevent false pressure readings if the end of the tube became pressed against the stomach wall). A very thin-walled rubber balloon, of a capacity of 40 to 45 c.c., was now firmly tied to the tube just above the hole, at least two ligatures being used. Rubber cement was employed if necessary to make the junction air tight. Next, the capacity of the balloon was measured by a suitable syringe, to determine how much air could be introduced without the elasticity of the balloon raising the pressure above zero. In the experiments about 5 c.c. less than this quantity was injected, thus preventing false readings due to the expansion of the air by body heat.

The balloon was now emptied by suction of a syringe on the tube, the tube was clamped, and the balloon swallowed by the subject. Then the balloon was distended by the proper volume of air, measured by the syringe. The tube was now gently pulled up until the resistance of the cardiac orifice was encountered, and then about 3 cm. more of the tube was swallowed. position of the balloon was sometimes verified by fluoroscopic observation. The end of the tube was next attached to a glass U-tube half filled with water, and the clamp released. The pressure could now from time to time be read off directly on a small scale. It was found advisable to clamp the tube before changing posture, to prevent spilling the water. At the end of each experiment the air content of the balloon was measured to determine whether leakage had

occurred. As a rule the volume removed was 1.5 to 2 c.c. greater than that introduced, due to expansion by body heat. Graphic records were readily made by attaching the free end of the tube to a Marey's tambour of suitable size.

RESULTS

The tracings showed large and rapid changes in pressure, synchronous with respiration, and small variations synchronous with the heart beat. Normal inspiration was invariably accompanied by a rise in pressure, which fell back quickly to the original level on expiration. The chief factor in the inspiratory rise, as noted by Emerson, was the descent of the diaphragm. If the subject tried to breathe with the thorax alone, or if a coil of rope was wound tightly around his abdomen, inspiration was marked by a slight fall in pressure, succeeded by a moderate rise. Any attempt to inspire with the chest held inactive, either voluntarily or by being tightly wound with rope, was accompanied by a quick rise in pressure much like that of normal inspiration.

A base-line formed by joining the expiration levels indicates the pressure with all or nearly all of the influence of the diaphragm removed. This base-line is almost flat after a meal and remains so for a variable period, after which slow undulations may be observed. These undulations were recorded by Moritz. They appear to be due to changes in tone of the smooth muscle of the stomach, and are probably the beginning of hunger contractions. Voluntary changes of tension of the abdominal musculature greatly affect the readings. A cough or a sneeze will raise the pressure enormously. Very definite and striking effects on intragastric pres-

TABLE I

EFFECT OF POSTURE ON INTRA-GASTRIC PRESSURE

Posture	Subj	ect A	Sub	oject B
Standing. Standing very erect. Stooping, with hands on knees Sitting, with back rest. Sitting erect. Lying on back. Lying on left side. Lying on right side. Lying on right side, with left hand behind head. Hanging by hands.	$\begin{array}{c} + 2 \\ - 2 \\ + 8 \\ + 4 \\ + 6 \\ + 12 \\ + 3 \\ - 1 \end{array}$	m. H ₂ 6	+60 -3 $+10$ $+6$ $+7$ $+11$ $+2$ -1	cm. H ₂ 0

sure are produced by changes in posture. The pressure readings at the end of expiration in a number of postures in two normal subjects are shown in Table I. These measurements were made within an hour after a mixed meal; the pressures four or five hours later showed no appreciable change, except the variations due to the slow undulations mentioned above.

The subatmospheric pressures were observed in all normal subjects examined, though not in all postures or at every examination. In some subjects subatmospheric readings were not obtained until the second or third observation, and this early failure was ascribed to irritation of the pharynx by the tube. Subsequent experiments yielded subatmospheric pressures with great regularity, especially in the stooping posture. One subject, however, was an exception to this rule. He was a short, athletic man aged 21, weighing 120 lbs. In only two of seven observations did he show pressures below atmospheric. Table II shows the lowest readings consistently obtained in 10 normal subjects in three postures. The subjects varied in age from 20 to 40, and in weight from 120 to 220 lbs.

TABLE II
SUBATMOSPHERIC INTRA-GASTRIC PRESSURES IN TEN
NORMAL SUBJECTS

Subject		on right ft hand p	Stoon hands o	ping, m knees		ing by nds
A	-1 ci	m. H ₂ 0		m. H ₂ 0	-6 c	m. H ₂ 0
A B C D E F G	-1	"	-3 -3 -2 -3 -2 -2	66	-6	66
C	-0.5	66	-3	66	-3	6.6
D	+3	6.6	-2	66	-0.5	66
\mathbf{E}	+1	4.6	-3	44	-5	66
\mathbf{F}	+3	66	-2	66	-2	66
G	+3	66	-2	44	-4	44
H	+3	66	-1	66	-2	66
Ī	-0.5	66	-4	66	-5	66
Ĵ	-2	66	-4	66	-5	6.6

Subatmospheric pressures were not temporary or accidental occurrences, for in two subjects in the right-sided position, and in one in the stooping posture the pressure was below zero continuously for ten minutes, except at the height of inspiration. In one subject the pressure was –5 cm. of water for short periods in the stooping posture, and in another it once reached –20 cm. while hanging by the hands.

Pressures during gastric evacuation. — In order to test the relationship of pressure in the fundus to gastric evacuation, two subjects were

observed under the fluorescent screen after barium meals. While one lay on his right side with his left hand behind his head, barium was seen to leave the stomach at the usual regular intervals during a period in which the intragastric pressure, except during inspiration, was constantly subatmospheric. The other subject stood erect, with similar results. The peristaltic waves had no demonstrable influence on the pressure in the fundus.

Water-drinking.—the effect of rapid distension of the stomach on fundic pressures was investigated. In a series of seven experiments on five subjects the pressure was measured in the stooping posture. The subject then drank 1 litre of tap water at 37°C. This required from $1\frac{1}{2}$ to 3 minutes. Following this the pressure fell to the previous level in three minutes or less in four of the experiments. Probably some of the water left the stomach during this interval, but it seems clear that the "receptive relaxation" of the fundus and of the abdominal muscles is quite rapid. In one of the experiments the subject drank the litre of water in 90 seconds, and 30 seconds later the pressure was -3 cm. of water.

External pressure.—To determine the effect of external pressure on the pressure in the fundus, two subjects entered a swimming-pool. Measurements were made in the standing posture while the subjects were immersed to varying depths. (Table III). The intragastric pressure increased with the external pressure.

TABLE III

EFFECT OF EXTERNAL PRESSURE ON INTRA-GASTRIC
PRESSURE

Depth of water	Subject A	Subject B
At pubes	+ 7 cm. H ₂ 0 + 7 " +10 " +17 "	+ 6 cm. H ₂ 0 + 6 '' + 9 '' +15 ''

Pressure in disease.—Measurements were made on a large number of hospital patients with various disease conditions. The results were variable, and few subatmospheric readings were recorded. Many of the patients were unable to cooperate fully because of language difficulties. The conclusion was reached that even in the most favourable circumstances, measurements of intra-gastric pressure would probably remain of

little use in the diagnosis of disease, because so many factors are involved in pressure production. It is true that in some conditions, such as ascites and biliary cirrhosis, the pressure is always high, but similar readings are found in patients who fail to cooperate.

COMMENT

The pressure in the fundus of the stomach at a given moment is the sum of the following factors.

- 1. The tension and active contraction of the intrinsic gastric musculature.
- 2. The pressure on the stomach of adjacent organs. The weight of the upper portion of the stomach wall itself should also be considered.
- 3. The tension and active contraction of the anterior abdominal muscles and the diaphragm.
- 4. Tight clothing, cramping postures, atmospheric pressure, and other external influences.
- 5. In certain postures, the weight of the gastric contents, the omentum, and other structures, pulling the viscera away from the diaphragm, creates a partial vacuum in the upper left abdomen.
- 6. The subatmospheric pressure in the thorax tends to cause subatmospheric pressure in the upper abdomen, provided that the diaphragm is not actively contracting.

The positive factors can be reduced to a minimum by suitable measures. External influences can be overcome by loosening the clothing, and assuming a comfortable posture. The anterior abdominal muscles can be relaxed voluntarily, and the influence of the diaphragm minimized by making measurements at the end of expiration. By adopting the right-sided or the handson-knees or hanging positions the liver and omentum do not press upon the stomach. Active contraction of the intrinsic gastric musculature has not been observed in the fundus, and peristalsis of the remainder of the stomach has no appreciable effect on fundic pressure.

The only positive factor remaining for consideration is the tension or "tone" of the stomach muscle. This must be very low, for it

is overcome in certain postures in all normal subjects by the subatmospheric pressure created by the drag of the viscera and the subatmospheric pressure in the thorax. Since the subatmospheric pressure occurs whether the stomach is full or empty, its production is not due solely to the weight of the stomach contents. muscle of the stomach is also remarkable for its ability to relax very rapidly for the reception of food and drink, as shown in the experiments on water drinking. The observation that barium can leave the stomach in the normal rhythmic manner while the pressure in the fundus is subatmospheric is of some importance, for it confirms the view of Moritz that tonic contraction of the fundus plays no part in gastric evacuation.

The investigation is now being extended to patients complaining of various forms of abdominal discomfort, in the hope that some light may be thrown on the causes of these symptoms.

CONCLUSIONS

Pressure in the fundus of the stomach is easily measured and varies with postures, respiration, and external influences. Pressure in the fundus is much lower than in the pyloric portion.

Subatmospheric pressures can be demonstrated in the fundus in all normal individuals in certain postures.

The "tone" of the intrinsic muscle of the fundus is very low, and tonic contraction of the fundus does not assist in normal gastric evacuation.

Receptive relaxation of the gastric and abdominal musculature is very rapid.

Measurement of intra-gastric pressure is unlikely to prove of much value in the diagnosis of disease.

REFERENCES

- REFERENCES

 1. EMERSON, Arch. Int. Med., 1911, 7: 754.
 2. Kelling, Samml. klin. Vorträge (Inn. Med.), 1896, p. 487;
 Zeit. f. Biol., 1903, 44: 161.
 3. Keppich, Arch. f. klin. Chir., 1921, 116: 276.
 4. Moritz, Zeit. f. Biol., 1895, 32: 313.
 5. von Pfungen, Central. f. Physiol., 1887, 1: 220, 275.
 6. Quincke, Deut. Arch. f. klin. Med., 1878, 21: 453.
 7. Reprev, Vrach, 1890, 11: 405, 460.
 8. Schreiber, Deut. Arch. f. klin. Med., 1883, 33: 425
 9. Sherrington, Brain, 1915, 38: 191.
 10. Wagoner, Am. J. M. Sc., 1926, 171: 697.

SCIATIC SCOLIOSIS*

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ONE of the problems frequently confronting the general practitioner is that of low back pain. Not only is he faced with this complaint at frequent intervals but the difficulties attendant on its interpretation share with headache the distinction of having unlimited possibilities. Of late years a great deal of attention has been devoted to this complaint by members of the profession, resulting in a more accurate and comprehensive understanding of the whole problem. Low back pain is classified as symptomatic and idiopathic. I propose to deal only with the latter and with one phase of it, namely, sciatic scoliosis.

HISTORY

This condition has been known to the profession for a great many years. The name "sciatic scoliosis" was given by Valentini in 1851. Kocher also used the term early. Charcot in 1886 noted the relation between sciatic neuralgia and a spinal list, *i.e.*, an inclination of the trunk. Albert, Nicoladoni, Gussenbauer, and others described the condition early.

DEFINITION

Kleinberg defines sciatic scoliosis as a painful lateral deformity of the trunk that affects only adults. The name is not exactly descriptive of the actual condition because, in the majority of cases, there is no real scoliosis and pain along the great sciatic nerve is an inconstant symptom. Sciatic scoliosis should not be regarded as a disease but rather as a symptom or syndrome, and is frequently associated with or is a result of several conditions, such as myalgia of the lumbar muscles, sacro-lumbar or sacro-iliac disease, and possibly so-called sciatica. Again, the spinal list is usually contralateral or away from the affected side, the proportion being given by some writers as one to six, by others as one to four. A few writers go so far as to state that cases with a homolateral list are not true sciatic scoliosis. This is probably not correct, as some of these in later articles have changed their views and classify them as true sciatic scoliosis. Calissano and Theole describe what they please to call an "alternating scoliosis", the spinal deviation varying from time to time as the patient wishes to rest one or other anatomical part.

ANATOMY

Before entering on a discussion of the various phases of this subject, I wish very briefly to call attention to the general anatomical structure of the lower back. It is composed of the lower lumbar vertebræ, together with the sacrum and the posterior part of the two innominate bones. These are all held together by the following very heavy ligaments.

1. Between the sacrum and ilium we have (a) the anterior sacro-iliac ligament; (b) the posterior sacro-iliac ligament, which is subdivided or reinforced in such a way as to form the superior transverse ligament and the inferior oblique ligament.

2. Between the sacrum and ischium we have (a) the great sacro-sciatic ligament, which is placed posteriorly; (b) the lesser sacro-sciatic ligament, which is placed anteriorly.

3. Attaching the pelvis to the spinal column, we have (a) the sacro-lumbar ligament or what is probably better described as the anterior common ligament; (b) the ilio-lumbar ligament; (c) the supraspinous ligament. The whole are united together and held in such a way that the normal inclination of the pelvis forms an angle of about 50° with the horizontal plane.

ETIOLOGY

Sciatic scoliosis rarely if ever occurs before the age of puberty and as seldom after sixty years. It is more common in males than females, and between the ages of thirty and fifty. It occurs in those engaged in a strenuous or hazardous occupation. Here, however, some writers state that occupation has little if any-

^{*}Read before the Alberta Medical Association, Calgary, September 17, 1931.

thing to do with the etiology, claiming that the act of stooping to pick up so simple an object as a sheet of paper has started a train of symptoms that eventually led to sciatic scoliosis. In a general way, it may be said that the cause is either infectious or traumatic, the trauma being either of the mild or static variety or possibly a major injury. It may result from various low back conditions. Of these, several have been noted.

- 1. Disease of the sacro-iliac joint, either infectious or traumatic. The trauma may be no more than a simple uncoordinated muscular action or, as noted before, may be a major injury, the strain taking place in either the muscles or ligaments or both. If severe or repeated, and particularly if there should be a focus of infection somewhere in the body, an arthritis may result.
- 2. A sprain of the lumbo-sacral joint may result in a sciatic scoliosis and is almost as frequent a cause as sacro-iliac trouble. It may also be complicated by arthritis due to focal infection, the source of this being located in tonsils or teeth. It has been claimed too, and particularly by Osgood, that colonic stasis may be the source of the toxemia.
- 3. Strain of the muscles and fascia of the back, brought about by a single injury or a succession of traumata in certain occupations. This is believed to be due to a tearing of some of the fibres of the erector spinæ muscles or the lumbar fascia; the tear, followed by a deep-seated extravasation of blood, causes backache and eventually the resultant deformity. Usually the lesion is found near the attachment of the soft tissues to the iliac crest, and the severity of the symptoms depends on the extent of the injury.
- 4. Cases are found in which the pain is over the gluteal muscles, particularly the gluteus medius. Careful examination reveals small masses, apparently fibrous nodules, in the muscle substance, resembling closely the condition found in the lumbar muscles. This lesion in the beginning is seldom severe enough to incapacitate the patient, but repeated injury, due to the patient continuing his employment, results in such a painful condition of the muscle that a compensatory tilt of the trunk is initiated.
- 5. So-called sciatica, as an etiological factor, is not well understood. Pain is present in the hip or radiates down the nerve. Tenderness is pres-

ent at the great sacro-sciatic notch and, in some cases, at a lower level. There is frequently a wasting of the thigh muscles but evidences of a true neuritis are absent. It is suggested by Kleinberg that the lesion consists of an injury to the soft parts about the lumbo-sacral cord. Adhesions resulting about the nerve cause neuralgic pains. This condition may be either toxic or traumatic.

6. Congenital malformations of the transverse process of the last lumbar vertebra, with or without sacralization, is sometimes referred to as a cause of sciatic scoliosis. This is questionable, as the majority of these cases clear up after the usual treatment without correction or removal of the anomaly. The argument is also advanced that the condition has been present for forty or fifty years and, until the accident occurred, no symptoms had been noted.

CLASSIFICATION

Steindler classifies sciatic scoliosis in three ways: His first classification is based on the theories of the cause of the spinal list:— (a) reflex muscular contracture; (b) paralysis or paresis of the musculature of the trunk; (c) a shifting of the body weight; (d) maximum relaxation of the nerve trunk or its roots to avoid neuralgic pains caused by certain movements.

His second is based on the location of the nerve lesion or the part of the nerve pressed on, which is indicated by tender areas:— (a) high, where the location is from the foramen to the conjugation of the plexus; (b) median. This area is located between the intertrochanteric fossa and the great sciatic notch; (c) low, that is below the trochanteric fossa.

His third is based on the spinal list:— (a) contralateral list, accompanying the involvement of the roots of the plexus from the foramen to where they unite. The change in position of the bony structure opens up the foramen, relaxing the ligaments and sacro-iliac articulation; (b) homolateral list. Secard believes this position accompanies the median involvement of the nerve; *i.e.*, from the intertrochanteric fossa to the great sciatic notch, inasmuch as this type of spinal list relaxes both the sciatic and sacral plexus; (c) alternating scoliosis. This variety probably occurs when the localization covers both the high and median positions. The change

in posture gives relief to first one and then the other tender area.

SYMPTOMS

The onset of the symptoms in sciatic scoliosis may be sudden, as in traumatic cases, or insidious, as in those due to an occupational strain or secondary to a sciatic neuralgia, the toxic or infectious variety also falling in this group. The backache may be mild for weeks and, after some minor injury or even without recognizable trauma, suddenly becomes severe. There may be a history of repeated mild attacks, or the symptoms may be severe from the onset. Pain is the patient's chief complaint. The pain is most intense over the site of the primary lesion and less intense over the area of radiation. The localization is usually in the lower part of the back, most often in the sacro-iliac or sacrolumbar joints, but may be present in the sciatic area only. The radiation may be across the gluteal muscles or down the back of the thigh and leg. Regardless of where the pain originates, this radiation usually exists. The pain in true sciatic scoliosis radiates down one leg only. This is important from a diagnostic standpoint. The pain is aggravated by movement such as walking and stooping, and is relieved by rest, either by lying quietly in bed or holding on to some body, such as leaning over a table with the body bent forward and the affected leg flexed and slightly abducted.

EXAMINATION

In making an examination, one's attention is drawn to the peculiar attitude of the patient. There is a definite spinal tilting, the direction in about 75 per cent of the cases being away from the affected side. The degree of tilting is dependent on the severity of the case. There is as well in some cases a slight S curve, the convexity in the lumbar area being towards the affected side. With this there is a compensatory dorsal curve, the convexity being towards the sound side. The whole spine, as well as being tilted to one side, is also bent slightly forward.

The next characteristic feature of the patient's attitude is a decided flattening of the back. There is a loss of the lumbar curve and, as well, some flattening of the dorsal curve, the whole position of the spinal column resulting in a so-called flat back. The patient stands with the back tilted and flattened, as just stated, but he

also has the leg on the affected side slightly flexed, abducted, and, in the majority of cases, externally rotated. In a few cases the rotation is internal. The back is held rigid in the attitude of deformity due to a spasm of the back muscles. This is a protective mechanism to minimize pain and the muscle spasm is greatest in the upright position. In the majority of cases, the spasm relaxes after the patient has rested in the supine position. The motions of the spine are limited, due to this muscle spasm, and forced motion is painful. Flexion is more markedly restricted than any other movement. Lateral inclination away from the painful side is usually more restricted than motion towards it. This is not always constant, varies with the spinal list, and may be reversed.

Tenderness is a constant sign; in fact, is rarely not found. The localization of the area varies and in size may be very small. It is most constantly found over the sacro-iliac joint, and in one series was present in 42 per cent of the cases. In order of frequency, the next area most often tender is over the sciatic nerve just as it emerges from the great sacro-sciatic notch. In the series just quoted, it was present in 28.5 per cent of the cases. Other areas where the tenderness may be located are the lumbosacral joint, the gluteal region, the fifth lumbar spinal process, and over the muscles of the lower lumbar area. As the tender area may be very small, the lower back should be examined slowly and methodically.

The patient should be examined in the standing position, sitting, and lying down. In the first two, flexion, hyperextension, and rotation should be practised, these movements in the majority of cases revealing valuable information. In the supine position, straight leg raising (Kernig's sign) is usually found to be very much restricted. Rarely is one able to raise the leg over 30 per cent and in some cases not over 10 per cent. Laguere's and Gainslen's tests should also be made. Lateral compression of the pelvis, with the patient lying on the side, will frequently demonstrate tenderness in the sacro-iliac joint of the affected side. patient should also be examined, while lying on his face, for pain on hyperextension and tenderness along the sciatic trunk. lower extremities are measured, some wasting will frequently be found on the affected side. In the majority of cases, the roentgenogram is entirely negative. The positive findings are evidences of arthritis in the sacro-iliac and sacro-lumbar joint. These are in the nature of haziness and spur formation. In other cases, there is some abnormality such as sacralization of the last lumbar transverse process or some change in the angle of inclination of the pelvis. A case of low back pain is not completely investigated without a neurological examination. The female should be examined gynæcologically and the prostate should be examined in the male.

DIAGNOSIS

In arriving at a diagnosis one presupposes a working knowledge of the ordinary symptoms just discussed. Four main conditions must be differentiated.

- 1. Spinal cord tumour. In this condition, the pain, while usually bilateral, may have the same character and distribution as in sciatic scoliosis, but here we have sensory and motor disturbances, while in sciatic scoliosis the only change found is a loss of the Achilles tendon reflex. In the case of spinal cord tumour, there are extensive changes in the reflexes, difficulty in the control of the rectal and bladder sphincters, and a definite cord level to the sensory changes. A spinal tap may help to make the diagnosis more definite. In early cases, a cord tumour may be mistaken for sciatic scoliosis.
- 2. Tuberculosis. In advanced cases of Pott's disease, differentiation is easy, but early a differentiation may be difficult. Continuous muscle splinting in any position, a knuckle of bone, and x-ray changes will help to establish the diagnosis.
- 3. Tumour of the spine. In this condition in early stages the pain is not very severe, but is not relieved by a change in position or by the ordinary sedatives. The x-ray, while giving early information, is not always positive; it may reveal a peculiar mottling of a body of a vertebra. As primary tumour of the spinal column is rare, there is always the possibility of finding a primary lesion at some other location in the body.
- 4. Fractured spine. Here the location of the pain, tenderness, and an x-ray help to make a differential diagnosis possible, always bearing

in mind the possibility of a Kümmel's kyphosis or post-traumatic compression of a vertebral body.

5. Finally, backache may be due to a general systemic condition or may be of gynæcological or genito-urinary origin, but is usually recognized by a thorough general examination.

Prognosis

In a case of uncomplicated sciatic scoliosis; *i.e.*, a case without any arthritis and without focal infection in the system, the prognosis is exceedingly favourable and, with appropriate treatment, one may confidently expect a cure. When arthritis is present, the prognosis should be more guarded.

TREATMENT

For the sake of simplicity in outlining the treatment, I am dividing the cases into mild, moderately severe, and severe, depending on the intensity and duration of the symptoms.

Mild.—In the mild cases, a cure may occur spontaneously, the patient continuing with his work. He may, however, require certain assistance, such as the ordinary analgæsics, massage and mild counter-irritation, the use of radiant heat, and possibly a belt or grid-iron strapping with ordinary adhesive tape.

Moderately severe. — Patients will probably have to submit to rest in bed and may have to be manipulated under an anæsthetic for help in restoring the lumbar curve and breaking down adhesions, this to be followed by massage, radiant heat and diathermy, and by the use of a belt or light spinal brace or jacket. The patient should resume his occupation only after a period of re-educational exercises, and the whole will probably require from three to six weeks.

Severe cases. — These require manipulation according to the Jones method, the application of a cast from just below the arms to the knees, care being taken to see that the normal lumbar curve is re-established. The patient remains in this position in bed for about six weeks. After removal of the cast, the patient is allowed up and about very gradually, massage and re-educational exercises being given for several weeks. He should be allowed back at work in from six to eight weeks after the cast is removed, and should wear a belt or jacket. The underlying condition should receive careful attention and

all foci of infection removed and occupational factors corrected when possible.

I have selected several cases from our records to emphasize, if possible, several points brought out in the review.

CASE 1

J. M., a male, thirty-eight years of age, a painter and decorator. His history dates back to 1915, when he was thrown from a horse, striking on his right hip. From then until 1930 he had frequent attacks of pain around the right sacro-iliac area. In 1930 the pain became severe and radiated down the back of the thigh. He felt better after a night's rest, but found he was unable to stand straight, and flexion of the trunk increased the pain. Examination showed a spinal list to the left and slight forward bending with flattening of the lumbar curve. Bending to the right was painful. Straight leg-raising was not more than 15 per cent and there was tenderness over the nerve at the sacro-sciatic notch. Roentgenograms were negative. He was manipulated and kept in a cast for six weeks, followed by the usual treatment. He is now up and about.

CASE 2

D. H., a male, aged forty, a miner by occupation. About a year ago, while lifting a heavy timber, he felt a sharp pain in the back of his right hip. After a short rest, he continued with his work for a month, all the time having pain in the back of his thigh and in the hip. He was unable to work from this time and pre-sented himself for treatment several months later. At the time of examination he had a left spinal list, slight forward bending, a loss of the lumbar curve, and he walked with a limp. There was a slight S curve to his Straight All spinal movements were restricted. leg-raising was much less than normal, and there was tenderness over the nerve at the sacro-sciatic notch. The roentgenograms were negative. He was manipulated and treated in the usual way, with satisfactory results.

CASE 3

F. W. B., male, aged forty-one, fire boss. lifting a mine car, he stated that something happened to his back; he was not quite sure what it was. rate, he had pain, but continued to work for two days. At this time he was compelled to stop on account of the pain in his right hip, which radiated down the back of his right thigh. He went to bed and was comfortable except when he turned over. A cast was applied to his body without manipulation, and, when removed, he showed no improvement. Examination of this patient

revealed a spinal list to the left, a flat back, restricted spine movements, and a well marked Kernig's sign with the right leg. The right thigh was one inch smaller the right leg. than the left, and the right gluteal muscle relaxed. There was tenderness over the upper part of the nerve. Roentgenograms were negative. He was manipulated and is in a cast at the present time.

CASE 4

J. F. H., male, aged forty-two, a farmer. He stated that since 1917 he had had frequent attacks of pain in his back and left leg. His first attack was in the army in 1917 and lasted for three months. He was free until 1922. Since then he had had them once or twice a year, lasting about six weeks. His most recent attack began about six weeks previously, with pain in the back, aggravated by stooping. After three weeks, the pain radiated down the back of his left leg. This pain was shooting in character and extended to the dorsum of the foot. It kept him awake at night. His left leg was weak on walking.

Examination showed a list of the whole trunk to the left. There was a flattening of the lumbar curve with slight forward bending, pain on pressure over the left sacro-iliac joint and along the left sciatic trunk. Straight leg-raising on the left caused pain. There was spasm of the muscles of the left buttock. Relief was obtained by flexing the left leg on the trunk.

CONCLUSIONS

Sciatic scoliosis is not a definite disease but is one manifestation or complication of a low back condition.

- 2. Its recognition serves to identify a distinct type of back deformity.
- 3. Its recognition further helps to unravel the complex problem of low back pain.
- 4. This type of spinal deformity in the majority of cases readily yields to treatment.

BIBLIOGRAPHY

- 1. Osgood, J. Bone & Joint Surg., Oct., 1927, 9: 667.
 2. Kleinberg, Int. J. M. & S., 1929 42: 631.
 3. Kleinberg, Am. J. Surg., 1929, 7: 89.
 4. Chandler, J. Am. M. Ass., 1929, 93: 1447.
 5. NUTTER, Canad. M. Ass. J., 1925, 15: 1055.
 6. ROSENBACH AND FINKELSTEIN, J. Am. M. Ass., 1925, 84:
- 7. KLEINBERG, Arch. Physiother., X-Ray, Radiol., 1931, 12: 333.
- STEINDLER, Diseases and Deformities of the Spine and Thorax, Saunders, Phila., 1931, p. 293.
 JONES AND LOVETT, Orthopædic Surgery, Wm. Wood, New York, 1923, p. 314.

THE PORGES-POLLATSCHEK TEST OF PREGNANCY .-At the recent meeting of the Royal Medical Society Dr. Göczy read a paper on his experience with this test on 50 pregnant and 50 non-pregnant women. The basis of the test is a skin reaction, the skin of pregnant women being said to be less sensitive to the injection of prolan than that of non-pregnant women. The injection of 0.2 c.cm. prolan intracutaneously in women causes a bright pink reaction 2 to 3 c.cm. in diameter; this conspicuous reaction is said to be entirely absent when the woman is pregnant. Göczy has experimented also with glanduantin and præhormon, both of which hormones correspond to the prolan of Zondek, with the difference that 1 c.cm. of prolan contains 100 rat units, while an equivalent amount of the other substances contains only 30 units. The test was a failure in 15 of the 50 pregnant women and in 22 of the control cases. Similar results

were obtained by other Hungarian investigators, who have arrived at the conclusion that the test is valid neither for the confirmation or for the exclusion of pregnancy.—The Lancet, 1931, 2: 314.

"Also, loke thou drynke not pure watir whan thou hast eten thi mete, but if thou have vsed it; for the cold watir put upon thi mete coldith thi stomak and quenchith the hete of thi digestioun, and confoundeth and grevith thi body. And if thou muste drynke watir for the grete hete of thi body, or of thi stomak, take it attemperatly and not ovirmoche attones ne to ofte." The Secrete of Secretes.

No discourse whatsoever can end in absolute knowledge of fact. Absolute knowledge of fact is immediate; it is experimental.—Hobbes.

ACTINOMYCOSIS

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A REVIEW of the literature indicates that actinomycosis occurs much more frequently in the human being than is generally supposed; no doubt many cases are not reported, and a goodly number are never recognized.

The manner of its occurrence in man is still a debated subject. Wolff and Israel¹ are of the opinion that the causal organism is a normal inhabitant of the gastro-intestinal tract and obtains entrance into the tissues through some abrasion of the mucous membrane. Bostroem² and also Mattson3 do not concur in this, but believe that it has its origin outside the human body and is capable of a dual existence, primarily as a saprophyte in old sod soil, from which it gains access to grains and grasses and through this medium becomes capable of infecting man and the lower animals. This organism is an aerobe, easily cultivated, and cannot be transferred to animals by inoculation, while the organism of Wolff and Israel¹ is anaerobic, growing only at body heat and is difficult to cultivate. Wright demonstrated that the organism found in nature differed from the bovine and human type in that it has no spore-producing elements.

The greatest single factor in the spread of the infection is the continuity of the tissues. Blood dissemination is also of great importance and may bring about disastrous metastasis by vascular infiltration. Spread by means of the lymphatics plays a minor role. Partsch, Kaufmann,6 and Grillo7 do not believe that this occurs, and are of the opinion that those cases in which such involvement is noted are merely tissues which lie in the path of the invasion. They report a case of actinomycosis of the tube and ovary in a woman aged 26, who gave a history of having been operated upon for appendicitis four years previously, the wound healing slowly with much scar formation. They also report from the literature 30 cases of actinomycosis of the tube and ovary, most of which occurred in the child-bearing period. Twentyone died, while 9 responded to surgical inter-

vention. In 20 of these cases the source of infection was apparently from the intestine, while the origin of the other 10 cases was unknown. The duration of symptoms varied from two weeks to thirteen years, although in the majority it embraced a period of three months to one year.

Frequently at operation the surgeon suspects that he is dealing with a neoplasm, and it is only by patient search that the characteristic organism with its radiating clubs is recognized. Irregular pockets of pus, with old sinuses separated by dense hyaline fibrous stroma, and associated with the presence of polymorphonuclear leucocytes surrounded by mononuclear cells, should always suggest the possibility of an actinomycotic infection. Brickner⁸ reports 5 consecutive cases of pelvic actinomycosis successfully treated by repeated operations and the injection of the sinuses with a 50 per cent solution of potassium iodide plus oral administration. In one of his cases he performed repeated operations over a period of ten years, with no recurrence for four years following the last.

Lord⁹ reports a case of primary pulmonary actinomycosis. The symptoms presented were cough; a scanty odourless sputum, at times streaked with blood; fever ranging from 99 to 101°. The clinical and radiographic aspects suggested a malignant tumour developing at the left root of the lung and to a less extent at the right root. Actinomycotic granules were found in the sputum; an abscess developed on the back; other lesions occurred on the right upper arm and on the right leg; evidently a case of dissemination by the blood stream. The patient died six months after the onset of symptoms. Lord observes that in pulmonary actinomycosis perforation of the chest wall occurs in about 80 per cent of cases.

Sanford and Voelker¹⁰ give a review of 670 cases. The occupations of those affected were given in 484 cases, and of these 230 were farmers, or followed an occupation closely re-

lated, such as teamster, drover, dairyman, etc. Eighty per cent of the cases reviewed occurred in males, the youngest being an infant of 28 days, and 2 had attained the age of 82 years; 60 per cent were of the head and neck, equally involving the jaw, neck and face; 18 per cent involved the abdominal wall, peritoneal cavity, intestines, appendix, and liver; 14 per cent were thoracic, involving the chest wall or lungs.

Three cases were of the subcutaneous or cutaneous type; 9, pelvic; 5, gluteal; 5, perirectal; 4, scrotal; 2, extremities; 2, finger; 2, thumb; 1 each, perineum, thigh, foot, heel, tubes, ovary, kidney, bladder, testis and penis. Actinomycosis of the bone is very rare in human beings, although cases have been reported by Caraven. 11 Chitty 12 reports 4 consecutive cases successfully treated by administering iodine in milk three times a day. He makes a colloidal solution by adding 5 to 10 minims of tincture of iodine to half a cupful of fresh milk. One of his cases was of the abdomen in a boy, following appendectomy. The diagnosis, however, was clinical, with no microscopical confirmation. A second case also was abdominal, a tumour being incised, and microscopical confirmation obtained. The third was a mass attached to the lower jaw, the diagnosis being confirmed by the microscope. The fourth was of the jaw and face. Heyerdahl,13 reports 21 cases of actinomycosis of the face and neck, the clinical diagnosis in all of these being confirmed by microscopical examination. They were all cured, and with good cosmetic results, following two to three radium treatments at intervals of six weeks. These cases had been observed from one to ten years without recurrence.

In the past ten years 5 cases have come under my observation.

CASE 1

A boy of nineteen years, a farmer's son, was operated upon for a ruptured appendix; two weeks later he developed a subdiaphragmatic abscess which was drained, the patient making a complete recovery, and the wounds healing nicely. He gained some thirty pounds in weight during the next three months. He then reported to me because of a slight purulent discharge where the through and through silkworm ligatures had been used. after this he developed an irritating cough and began to run a temperature of 99 to 101°, and commenced to lose weight. Before long a sinus developed in the right

pleural cavity about the tenth interspace; the pus showed the typical sulphur granules and the microscope identified the actinomycotic organism. Massive doses of potassium iodide were given by mouth, but the case proceeded to a fatal termination in six months.

CASE 2

A male, 45 years of age, a farmer by occupation, came with a large mass involving the tissues over the right jaw, with numerous sinuses from which exuded the characteristic pus seen in these cases. The diagnosis was confirmed by the microscope. Under an anæsthetic the infected tissue was thoroughly curetted and the part swabbed with Churchill's iodine. For some ten days I continued to swab as thoroughly as possible with iodine, and gave potassium iodide by mouth. As the case did not appear to be responding to this treatment, the tissues and all their parts under and around the lesion were infiltrated with a 2 per cent solution of potassium iodide at intervals of three or four days. After the first infiltration a great deal of diseased tissue sloughed away, and after this the lesion rapidly improved, so that in one month it had entirely healed with good cosmetic results, and there has been no recurrence in ten years.

CASE 3

A male, 26 years of age, consulted me because of a mass in the subcutaneous tissues of the left chest wall, which proved to be actinomycosis. This case responded to three infiltrations of potassium iodide solution, with no recurrence in eight years.

CASE 4

A farmer's wife, 46 years of age, presented a condition of actinomycosis of the thyroid, the diagnosis being confirmed by biopsy. As injections of potassium iodide in previous cases had proved quite painful, in this case novocain was added to the solution. Again apparent cure resulted, as there has been no recurrence in four years. The addition of the novocain to the solution added greatly to the patient's comfort during treatment.

CASE 5

A butcher, 41 years of age, came under my observation two months ago, at which time examination revealed a hard indurated painful swelling along each margin of the tongue, with small areas of whitish necrotic tissue, which on section was reported to be "actinomycosis." In this case two thorough infiltrations of the affected part with colloidal iodine have resulted in a return to normal, so far as one can observe from clinical examination.

REFERENCES

- 1. WOLFF AND ISRAEL, 1898, 151: 471.
- 2. BOSTROEM, Anat. w. z. allg. Path., 1891, 9: 1.
- 3. MATTSON, Surg., Gyn. & Obst., 1922, 34: 482.
- 4. WRIGHT, J. Med. Research, 1904-1905, 13: 349.
- PARTSCH, Deuts. Zeitschr. f. Chir., 1886, 23: 497.
 KAUFMANN, Contribution clinique, histologique, biologique a l'étude de l'actinomycose: sero-diagnostic de l'actinomycose, 1910, Paris.
- 7. GRILLO, Rif. Medica, 1898, 2: 301, 315, 325.
- 8. BRICKNER, Ann. Surg., 1925, 81: 343.
- 9. LORD, Med. Clin. N. America, 1925, 8: 1485.
- 10. SANFORD AND VOELKER, Arch. Surg., 1925, 11: 809.
- 11. CARAVEN, J. de chir., Par., 1910, 4: 368.
- 12. CHITTY, Brit. M. J., 1926, 1: 418.
- 13. HEYERDAHL, Brit. J. of Radiol., 1926, 31: 1.

THE CLINICAL ASPECTS AND TREATMENT OF SPLENOMEGALIES*

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IN studying the literature relating to this subject one cannot help but feel perplexed. There is no clear classification of the splenomegalies, and in consequence their treatment is obscure. I shall endeavour in this paper to indicate how we may arrive at a proper classification, in the hope that logical indications for treatment may follow.

GENERAL DIAGNOSIS

When we are confronted with a patient who has a mass in the left upper quadrant of the abdomen, the first question that arises is—What can it be?

It may be an enlarged kidney. Then the mass is rounded, somewhat or quite hard, elongated in the long axis of the body, and there will be urinary disturbance of some kind, possibly hæmaturia or pyuria, in the latter event elevation of temperature being present. In special cases, particularly if tuberculous in character, an enlarged ureter may possibly be felt per vaginam.

It may be a tumour of the stomach, surprising as this may appear. Such a case was reported at the Congress of Medicine at Paris in 1928. The patient was a woman, aged 52, whose health had been gradually failing. She had had little if any trouble with the stomach, merely a simple uneasiness in the left side. She had no urinary symptoms. A large mass was felt in the left upper quadrant of the abdomen, which was thought to be spleen. The blood showed merely leucocytosis and diminution of the red cells. Laparotomy revealed a large tumour of the stomach.

It may be an enlarged spleen, hard, irregular in outline, with a notched edge, extending down into the pelvis, possibly crossing over the median line, and, usually, fixed.

Supposing that the diagnosis is enlarged spleen, the first thing to be done is to examine

the blood. This is for the purpose of giving precision to the diagnosis, for splenomegalies differ widely, as do children of the same family. What will the blood show? One of three conditions; either (1) a hyperleucocytosis, or (2) a diminution in the red corpuscles, or (3) what I call an "indifferent" blood picture. With this information at hand one can usually specify the kind of splenomegaly that is present, and, in consequence, its treatment.

SPLENOMEGALY WITH HYPERLEUCOCYTOSIS

Splenomegaly with hyperleucocytosis means leukæmia. This disease is of two varieties according as the blood picture reveals a large number of myelocytes or the predominance of lymphocytes—spleno-myelogenous and lymphatic. We know that the relation of white blood cells to red is normally 1:650 or thereabouts. In leukæmia the ratio is altered and comes down, possibly, 1:10 or even 1:3.

Splenomyelogenous leukæmia is specifically characterized by the presence of myelocytes in the blood, and may also be attended by a drop in the red cells, though slight. It produces the largest spleen (with the exception of Gaucher's disease), a tendency to hæmorrhage, anæmia, with in the later stages ædema and ascites. The disease may be met with in young infants and may run an acute course. Curiously, it may show astonishing remissions. The prognosis is based on the appearance of megaloblasts in the blood picture, as well as hæmolysis, all of which proves how helpful the hæmatologist may be in this connection.

Lymphatic leukæmia is characterized by the predominance of lymphocytes in the blood. They may run up as high as 100,000. This form is much more serious than the myelogenous. If some affected with the splenomyelogenous form may live some two to four years, or exceptionally ten years, as reported by Grawitz, the lymphatic form will not run so

^{*}Read at a meeting of the Academy of Medicine,

prolonged a course. Indeed, at times it may be very acute. In lymphatic leukæmia the spleen is only moderately enlarged, but the lymphatic glands are enlarged all over the body.

Treatment is not hopeful in the case of leukæmia. At most may we hope to delay the fatal outcome. In the case of the myelogenous form x-rays are effective, to the extent of retarding the evolution of the disease. The size of the spleen is diminished. Each application is followed by a drop in the number of the white blood cells and a marked general depression. But the application of x-rays will not cure.

Chemically pure benzol, in doses of from 75 to 100 minims a day in olive oil or capsules, given for periods of ten days will prolong life. Surgical intervention is not often attempted, but Mayo, at the meeting of the International Society of Surgery in London in 1926, reported on 29 cases which were operated upon by splenectomy with only one death. These cases were temporarily improved, as indicated by the blood formula. Later in 1929, he reported on a total of 46 splenectomies, with only three deaths, the patients having been previously prepared by x-rays or radium.

The lymphatic type of leukæmia is practically beyond hope of cure.

SPLENOMEGALY WITH DIMINUTION OF THE RED BLOOD CELLS

In this group we have some six different diseases, each characterized by an increase in the size of the spleen and alteration in its function. Here, again, there is an altered blood formula, but, this time, there is a marked and progressive diminution in the number of the red cells with a corresponding loss of hæmoglobin.

Banti's disease. — This peculiar malady was first described by the Florentine Banti in 1884. It is a chronic affection of unknown origin, but probably due to some toxic agent. It is characterized by a progressive enlargement of the spleen not correlated with any known etiological condition such as malaria, syphilis, tuberculosis, leukæmia or cirrhosis of the liver. The red cells of the blood are gradually diminished, as is the hæmoglobin content; there is a tendency to hæmorrhage from the nose and, particularly the stomach; and, if allowed to run its course, the disease ends with cirrhosis of the liver, digestive disturbances, jaundice, and even ascites.

In the treatment of this curious disease neither drugs nor x-rays are of any avail, but surgery offers an absolute cure. Splenectomy is indicated in the early stages, though not later on. Iron, arsenic, and fresh air will supplement operation and complete the cure. It is obvious that here great responsibility is laid upon the physician, for he it is who sees the patient first. The happy result will depend upon his alertness, his sense of responsibility, and the precision of his diagnosis. The physician has but one thing to do, when his diagnosis is made, namely, to hand the patient over to the surgeon.

von Jaksch's disease.—Occasionally one will meet with an enlarged spleen in children. If the blood count shows a marked anæmia to be present one should think of the anæmia pseudoleukæmica infantum of von Jaksch. This condition was described by the great Prague clinician in 1889 as occurring almost exclusively in children. Here there is progressive anæmia with enlargement of the spleen, and occasionally of the liver. The little patients become short of breath on the least exertion, edematous, and rapidly lose ground owing to repeated hæmorrhages from the nose, gums, or bowels. The blood shows leucopenia with the The condition is presence of normoblasts. thought to be brought about by bad hygienic conditions, chronic dyspepsia, while syphilis and tuberculosis are possible contributory factors.

The treatment is medical, not surgical. General tonics, iron, and particularly arsenic, are indicated and will gradually produce a Aubertin and Labbé have also recommended benzol together with x-rays. Splenectomy is contraindicated.

Splenic anamias.—These present no special characteristics save an enlarged spleen and an ever increasing hæmolysis and concomitant drop in the hæmoglobin. There is no enlargement of the lymphatic glands and no indication The pathological findings in of leukæmia. these puzzling cases are various and have been well studied by Wilson and Mayo and also by Moynihan in England, Gaucher, Chauffard and Aubertin in Paris, and Senator, Bruhl and

Strümpell in Germany. The spleen shows proliferation, in some cases, of the endothelial cells (Gaucher type) or, in others, diffuse proliferation of all the splenic tissues.

The treatment of choice is splenectomy, which is called by Mayo "the triumph of surgery" in these cases. Tonics and blood transfusion may be necessary adjuncts, both before and after operation. Blood reconstituents are valuable. Of course, the propriety of operative interference depends primarily on the condition of the patient. Of 82 such cases reported by Mayo as having been operated upon, 73 were cured and 9 died, a most encouraging result, for usually the disease is fatal.

Hæmolytic jaundice.—Here, again, the spleen is enlarged. This disease is rather puzzling. Is the spleen or the liver the primary focus of infection? This is hard to say. The disease is characterized by fragility and destruction of the red blood cells, which, by liberating the hæmoglobin and iron, causes the jaundiced appearance of the skin. There are no signs of bile retention, no pruritus, no uncoloured stools, no urobilinuria, and no bradycardia.

There are two varieties of this strange disease: a congenital form, usually familial; and an acquired form. The cause is unknown. The course is prolonged in the congenital form; shorter and more dangerous in the acquired one. In these cases there is positive hope of cure through splenectomy, but this operation must be performed early before the patient has sunk too low. Furthermore, operation should not be undertaken during a pyretic period. An important point to remember is that, as Mayo showed, in 68 per cent of the cases there are stones in the gall bladder. Of 100 cases operated upon at the Mayo Clinic in 1929 only one died.

Pernicious anamia.—This disease is considered here along with the others because of the hæmolysis of the red blood cells and the accompanying lesions of the spleen.

First described clearly by Combe in 1822, then by Addison in 1855, this puzzling disease was further elucidated by William Hunter, of Guy's Hospital, from 1888 to 1900, and valuable contributions to our knowledge of it were also made by Percy, of Chicago, "whose experience in the surgical treatment of pernicious anæmia

is unsurpassed" (Moynihan). Percy pointed out the part played as an exciting cause by focal or cryptogenic infections in which the hæmolytic streptococcus is frequently found.

The treatment of pernicious anæmia was ineffective until Whipple, in 1923, introduced his treatment with raw liver. Some time later a stomach extract (ventriculin) was employed. These agents were supposed to act as stimulants to the hæmatogenic function of the bone marrow. We realize, however, that this form of treatment does not bring about a permanent As with insulin, the remedy must be persistently used. We are still searching for the real cause of pernicious anæmia and some way of eliminating it. The spleen, through its close circulatory connection with the liver, is an important link in the vicious circle bringing about the destruction of the red cells. If we can break the chain a cure may be effected and here surgery offers a helping hand. again, in 1929, reported a series of 62 splenectomies for pernicious anæmia. Four of the patients died in hospital, but none among the last forty cases, and 10 were still living and working five years after operation. transfusion may be indicated as a preliminary step, of course, in some cases. We have here a slight improvement over former methods, but we still look for something better.

Purpura hæmorrhagica.—This is a very fatal disease and one frequently accompanied by an enlarged spleen. In the more severe cases, where drugs are ineffective and the progression is steadily downward, we should have recourse to splenectomy, from which operation some report immediate and astounding results. The operation seems to extirpate the main focus of infection. "Removal of the spleen in chronic hæmorrhagic purpura acts like magic" (Mayo). Out of a series of 32 patients operated on for this condition only one died.

Splenomegalies With an Indifferent Blood Picture

In this group are placed Hodgkin's disease, amyloid spleen, various parasitic conditions, syphilis and tuberculosis of the spleen, and tumours.

Hodgkin's disease.—This, apparently, was first noted by Malpighi, of Bologna, in 1665, and in 1842 by Hodgkin, of Guy's Hospital, in

his paper entitled "Some morbid appearances of the absorbent glands and spleen." Four years later, Trousseau, unaware of Hodgkin's publication, described the disease anew, adding further observations, under the title of pseudo-leukæmia or lymphadenomatosis.

It is a disease of the lymphatic system, probably of an infectious nature, characterized by a gradual enlargement of the lymph-nodes, beginning usually in the neck and gradually invading the whole system, including the spleen and liver, and is accompanied by fever. The blood picture is indefinite. The red cells tend to diminish in numbers, but there is slight hyperleucocytosis if any. The disease affects young as well as middle-aged persons and is most often seen in males. All of my cases have been in males, and four of them in boys. Clark reported 43 cases, 37 of which were men. The disease runs a progressively downward course, simulating a bastard form of tuberculosis. However, its relationship to tuberculosis has not been positively proved. No cure has as yet been found for this disease, and surgery should not intervene here. cases belong to the noli me tangere class.

Pel-Ebstein disease.—This is closely allied to the last and might be regarded as an acute form. The disease runs its course in from two to four months, and is characterized by rapidly failing general health, recurring periods of high temperature, involvement of the mediastinal and mesenteric lymph-nodes, a gradually enlarging spleen, with a fatal termination. There is little or no alteration in the blood formula. A case of mine, a boy, fourteen years old, presented the above features, with slight hyperleucocytosis and a gradually developing leucopenia. This rare disease was well described by Ebstein, and later by Harvier, in the Paris Medical, 1925.

Amyloid splenomegaly.—This is only part of a generalized disease characterized by amyloid transformation, chiefly of the blood vessels, in the principal organs of the body. It ensues in cases of long-standing suppuration, usually in the pleura or bones. The course is extremely slow. The blood shows nothing further than a slight anæmia. The spleen may

attain a great size, as well as the liver, both showing intense infiltration with amyloid material, but, strange to say, with seemingly no alteration in their functions, at least as regards glycæmia and creatinæmia. As for the kidneys, which also show amyloid degeneration, evidenced clinically by marked albuminuria, their functional activities in respect of urea and chlorides seem to be unimpaired, at least for a long while. Elimination of the cause will retard the evolution of the disease, but no cure is known. The tissues are too deeply involved. The surgeon must keep aloof in these cases.

Syphilis and tuberculosis of the spleen.—Here the spleen may show decided and increasing enlargement. Against these conditions the usual general treatment is practically our only recourse, save that, in the case of syphilis, if antisyphilitic treatment does not control the growing enlargement of the organ, splenectomy is indicated, provided always that the general condition of the patient does not present an absolute contraindication. This is our only curative resource in this type of case.

Parasitic diseases.—These are malaria, hydatid disease, kala-azar, bilharziasis, and aspergillosis (due to the Aspergillus nodulans of Nanta). Happily, these are seldom met with in our country. Quinine, as we all know, is the best anti-malarial agent. Hydatids, due to the cysticercus form of Tania echinococcus, give rise to cysts in the liver, and less frequently in the spleen. The treatment here is surgical, formolization of the contents of the cyst, and marsupialization to the surface of the body, unless splenectomy appears to be clearly indicated.

DISCUSSION

The above are my conclusions in taking a general survey of splenic diseases, and show the complexity of the problem when we are faced with a case of splenomegaly. If we follow methodically along the lines indicated we can usually relegate our case to its proper class, and, this being done, the therapeutical indications are rendered clearer. It is hoped that this paper may contribute something to the elucidation of these problems and may point to a more rational therapy.

HÆMOPTYSIS FROM THE VIEWPOINT OF THE LARYNGOLOGIST

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EMORRHAGE from the throat is a frequent complaint of patients referred to the laryngologist. The source of the bleeding is rarely from the pharynx or esophagus, and still less often from the larynx itself. In the vast majority of cases expectorated blood is of pulmonary origin. It is still a common belief that blood from the lungs must be bright red in colour, coughed up with some effort, frothy with mucus, and accompanied with well-marked physical signs in the chest. However, in the early stages of consumption before the development of catarrh or a cough, small blood vessels are easily eroded by tubercles, allowing fresh blood to escape upward into the mouth on the slightest clearing of the throat. Occasionally a patient, otherwise in good health, complains that he expectorated some bright red blood suddenly without any effort, or that he wakened up at night and felt some warm, sweetish fluid in his mouth. To his surprise it was fresh blood, perhaps pure or mixed with a little mucus. The amount of blood may vary from a few cubic centimetres to a pint or even more with the slightest cough or exertion.

PLACE OF ORIGIN

The question now arises, "Where is the source of the bleeding?" This is not always an easy matter to decide. The origin of hæmoptysis falls usually into two groups, (1) pulmonary and (2) nasopharyngeal.

By far the greatest number of persons who seek advice for "bleeding from the throat" are suffering from pulmonary tuberculosis. In the relatively few cases in which hæmoptysis is not of pulmonary origin the source is the nasopharyngeal æsophageal tract.

According to de Reynier, blood from the lungs can be distinguished from other forms of hæmoptysis by the following points. "Expectorated blood is generally bright red at first, becoming purple or dark brown in the course of the following hours or days." He also says

that "blood-stained material from the pharynx is only expectorated in the morning hours and may reappear every morning for weeks or months. On throwing the sputum into water, if the blood comes from the pharynx, larynx or gums, it is at once dissolved on shaking it in the water; if the blood comes from the lungs, it remains in one mass and insoluble." Although the source of hæmoptysis can usually be located after a systematic examination, occasionally cases are seen which are undoubtedly pulmonary in origin yet neither auscultation, percussion nor x-ray findings are able to detect any physical signs in the chest.

The sources of hæmoptysis are varied and include almost every disease which affects the lungs and air passages. Such affections as influenzal bronchitis, emphysema, streptococcal or B. coli infection of the lungs, dilated bronchi, and mitral disease cause hæmoptysis occasionally, as well as various general conditions. These last include gout, purpura, scurvy, pernicious anæmia, leukæmia, hæmophilia, varicella, vicarious menstruation, mercurial poisoning, typhoid fever, arteriosclerosis, etc., but as they cannot be considered as common causes no further mention of them will be made. Bleeding due to trauma is also an occasional cause. Malingerers and hysterical persons sometimes induce bleeding of the gums to simulate pulmonary tuberculosis.

Although the above conditions concern more the field of general medicine, there are several sites from which bleeding frequently occurs, which are of the utmost importance to the laryngologist. In determining the source of hæmoptysis, excluding the lungs, a methodical examination of the following areas is necessary:

Nose.—Epistaxis,* usually from the anterior

^{*} Epistaxis is caused in over 90 per cent of all cases in Kiesselbach's area. This is situated on the nasal septum about a quarter of an inch within the nostril and a quarter of an inch above the floor of the nose. Four small arteries course along the septum and come together forming a network in this situation close to the surface.

part of the septum, the blood flowing backwards. (This is only in small amounts otherwise the blood also drops from the nose).

Nasopharynx.—Adenoid tissue.

Mouth.—Spongy gums. Vincent's angina.

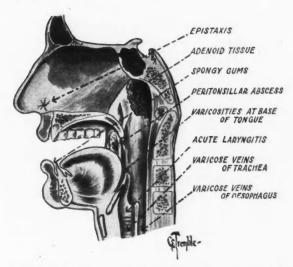
Pharynx. — Peritonsillar abscess, varicosities, especially at the base of the tongue in gout, cirrhosis of the liver, and influenza.

Larynx.—Acute laryngitis.

Trachea. — Varicose veins. Congestion from pressure of an aneurysm or an enlarged thyroid gland.

Œsophagus.—Varicosities and congestion from pressure outside the gullet caused by new growths.

The following figure shows in a graphic way the usual locations in the head and neck from which bleeding may arise.



Suppuration and ulceration in any of the above situations due to malignancy, syphilis or tuberculosis are also causes of hæmoptysis which must be considered.

SYMPTOMS

Frequently the only complaint of the patient is the presence of blood in the mouth on clearing the throat. If the patient reports between hæmorrhages, that is during the quiescent stage, it is sometimes very difficult to determine the point of origin of the bleeding. On the other hand, it is a wise procedure to instruct him to return at once when hæmoptysis occurs in the hope of finding, on examination, a clot at the source of the hæmorrhage. The entire mucous membrane of the air and food passages should be thoroughly examined, especially in the situations mentioned above.

After a careful search without finding a trace of a bleeding point, the case should be regarded as one of early pulmonary tuberculosis, until it is proved otherwise. This suspicion would, of course, be strengthened if other suggestive symptoms were present such as anorexia, loss of weight, fatigue, pallor, evening fever or history of pleurisy.

At times the laryngologist is requested to inspect the bronchial tree to determine the source of bleeding, and in such cases the blood can be seen through the bronchoscope welling up in the affected bronchus. This procedure, however, is usually contraindicated. The danger lies in aggravating the bleeding occasioned by the retching and straining of the patient on passing the bronchoscope or esophagoscope.

TREATMENT

Treatment depends on the etiology and of the discovery of the bleeding point.

Bleeding from the nose can often be controlled by means of a simple dry pack or tampon. More effective measures are packing gauze saturated in adrenalin, or chromic acid, and the galvanocautery. Complete rest in bed is essential and the patient given a bland non-stimulating diet. The fears of the relatives at the sight of blood must be allayed and the patient reassured. Alcoholic drinks and hot fluids should be forbidden.

When the pharynx is the source the patient is given ice to suck and the site of the hæmorrhage treated locally with astringents or the cautery. Hypodermic injections of morphia, gr. 1/6 to 1/4, with atropine, gr. 1/200 to 1/150, are very effective and large doses of thromboplastin and calcium lactate are said to increase the coagulability of the blood. Cold compresses to the throat are also helpful.

In cases of severe hæmorrhage from an abscess or malignancy it may be necessary to ligate the external or common carotid artery. When the hæmoptysis is of pulmonary origin the patient should be placed in a tuberculosis sanitorium, and the régime and careful treatment covering that condition instituted.

REFERENCE

1. DE REYNIER, Arch. Internat. de Laryngol., 1927, 6: 404.

THE RADIATION TREATMENT OF SOME SKIN AFFECTIONS*

BY C. M. HENRY, M.D., C.M., F.A.C.S.,

Regina

XI

IT is not my purpose to discuss all of the many skin diseases, whether infective, benign, or malignant, that plague the human being, but to deal with some of the more common skin conditions that do not respond to general medical treatment, while they may respond to some form of radiation therapy. In all skin infections it is just as essential that the cause be ascertained and a diagnosis made when treatment is to be given by radiation as when medical or surgical treatment is the method of choice.

Skin affections due to focal infections of the teeth, tonsils, adenoids, sinuses, gastro-intestinal, tubal, or prostatic conditions, also those due to addiction or susceptibility to drugs or toxins from without, or to deficient or overaction of secretory glands within the body, must be eliminated. Diabetic and nervous disturbances also require careful scrutiny.

ACNE

Acne in its various forms is one of the most common infections. When it does not respond to medical, dietetic, or serum treatment it will often respond to radiation therapy. Whether the infection is local or general, good results are obtained by a combination of ultra-violet and x-ray treatment. The patient is given onesixth of an erythema dose of x-rays every five to seven days, for four or five exposures; then exposure to the mercury quartz lamp at 20inch distance (F.S.D.), at 70 m.a., to effect a skin erythema, every second or third day, and continued for a period of two to three weeks. The patient is instructed to steam the affected areas, and to scrub thoroughly with green soap and hot, soft water, using a brush or rough cloth. This is to be followed by careful drying and then sponging with a good quality of

gasoline. Usually within a month the skin is clear, except for former pitting, and with careful medical instruction as to after care, the condition does not return.

IMPETIGO

When treatment is given at the beginning of the infection, one-fourth of an x-ray erythema dose will usually effect a cure, but if the infection has been present for several days quicker results are secured by the combined use of x-rays and quartz lamp treatment. Usually one exposure of x-rays, followed by the lamp at two-day intervals for a week, will clear up the condition.

ECZEMA

According to Highman eczema is the result of a skin idiosyncrasy to precipitating causes, external in a preponderance of cases and internal in the remainder. It is not an external disease or an internal disease. It is both, always, and at the same time, and often responds to radiation therapy when other remedies fail. The patient is either cured or much improved by either x-ray or quartz lamp, or a combination of both. However, careful judgment must be exercised in treating the acute forms as compared with the chronic conditions. The duration of treatment often depends on the history of the disease and the physical and mental influence exerted on the patient.

PSORIASIS

The cause of this condition is not known. However, it will often respond to the water-cooled mercury quartz lamp applied very closely or in contact, while if the disease is widespread over the body, x-rays and the air-cooled quartz lamp will produce good results, but a tendency to relapse after months or years is frequent. Those patients whose skin will clear following the summer bathing season are favourable subjects for radiation therapy. Treating the ovary, pituitary, thyroid and

^{*}This is the eleventh in the series of articles published in the Canad. M. Ass. J., dealing with physiotherapy. The preceding papers will be found in 1931, 24: 263, 409, 539, 679, 831; and 25: 65, 164, 311, 444 and 582.

suprarenal glands with x-ray will often result in a cure when general radiation fails.

FURUNCULOSIS AND CARBUNCLES

In both of these infections the boil may become aborted if the treatment by x-rays is given in the inflammatory stage, but if pus is present it is advisable to express the pus, or excise, and then expose to the x-rays. It has been proved beyond question that convalescence is much shortened, pain and discomfort relieved, and the possibility of a resulting keloid eliminated.

Tinea Capitis, Tinea Tonsurans and Sycosis Barbæ

These respond to one x-ray treatment, but the dose must be carefully measured to cause epilation only, and not to destroy the hair follicle. The hair will drop out in from three to four weeks and should return in eight to ten weeks. Strict instructions should be given the patient not to apply any medicament to the treated area, as disaster may follow, and the radiation therapist be given the credit for a permanent alopecia.

WARTS, CORNS AND MOLES

These disappear when rather heavy unfiltered doses of x-ray are administered. The surrounding skin area must be protected by suitable lead filters. X-rays are a specific for plantar warts. One exposure, if accurately measured, is sufficient.

ERYSIPELAS

There is no medical treatment that will terminate erysipelas so quickly and effectively as one exposure to x-ray treatment. The effects here are as surprising and immediate as when antitoxin is administered for diphtheria. As with antitoxin, the earlier in the course of the disease the x-ray is administered, the quicker its reaction. In twenty-four hours the temperature approaches normal; delirium and headache vanish; the swelling subsides; and the patient will often be able to resume his ordinary vocation within one week, free from infection.

ACTINOMYCOSIS AND BLASTOMYCOSIS

This infection may be benefited and often cured by repeated treatments of x-ray therapy of moderate dosage. The assistance of full

doses of potassium iodide is also indicated in ray fungus conditions.

NÆVI

As it is difficult to keep a young child quiet long enough to administer x-ray treatment, it is advisable to apply a radium plaque or pack for the required time. When radium is used it is necessary to repeat the treatment at two or three monthly intervals until the desired result is obtained. With x-ray, when it can be employed, one treatment is often sufficient. There are certain kinds of nævi in which surgical diathermy is preferable. However, for the face or exposed surfaces, x-ray or radium is the method to be preferred in all forms of raised nævi or hæmangioma. The port-wine form of nævus is not usually amenable to any form of treatment.

KELOID

This condition is favourably influenced by either radium or x-rays. Fresh or newly formed keloids respond and disappear quicker than the dense, fibrous, contracted variety, but, like nævi, require repeated treatments at intervals of two to three months, over an extended period of time.

ALOPECIA AREATA

Narduci reports his results from the use of ultra-violet rays in the treatment of 25 cases. In 17 a complete cure was effected after from 16 to 35 exposures. The technique employed is to use a water-cooled mercury quartz lamp, applied at a distance of one-half inch from the area, administering a full erythema dose twice, at three-day intervals. Repeat this every two weeks until three or four series are given. Within six weeks the hair will reappear. Occasionally, a small area will recur, when the series is repeated.

ADENOMA

Whether this condition be due to tuberculosis, Hodgkin's disease, lymphosarcoma, or some other form of blastomycosis, or to thyroid intoxication, x-ray exposures of moderate intensity, with filtration and time, will produce beneficial results. Treatments repeated at intervals of a few weeks will reduce the growth and relieve symptoms, prolong life and, at times, produce lasting and beneficial results.

RODENT ULCERS, SENILE KERATOSIS, SQUAMOUS EPITHELIOMA AND ENDOTHELIOMA OF THE SKIN

The results by radiation therapy are so well known in these conditions that comment is hardly necessary. Suffice it to say, that these conditions are less apt to recur when treated by x-ray or radium than they are by surgery, while there is no resulting deformity or mortality. The clinical cures are higher than by any other means of treatment.

CONCLUSIONS

Radiation therapy is the treatment of choice in a great many skin affections, but needs to be properly selected and applied.

Correct diagnosis is essential, and the cause of the disease carefully sought after and removed where possible.

Radiation treatment is not a cure-all, and its action is largely empirical at the present time. However, if it is judiciously applied it is of great value in a large number of skin diseases.

A STATISTICAL REVIEW OF 525 CASES OF LOBAR PNEUMONIA*

By A. H. MACCORDICK, M.D.,

Montreal

PNEUMONIA as a definite entity, has been known since the time of Hippocrates. In the third century A.D., Aretaeus described the blood-stained sputum, and in 1690 Morgagni and Valsalva wrote on the pathology of the disease. It was not, however, until as late as 1819 that Laennec gave us a modern description of the clinical characteristics. Pneumonia is of all too frequent occurrence. Norris and Farley, writing in Osler's System of Medicine, state that from 9 to 10 per cent of all deaths are due to this disease. Nor could it be claimed, until recently, that any special method of treatment has been of much avail. The

advent of serum, however, and its eventually being made more available from a financial standpoint, may markedly lessen the mortality.

Pneumonia being of an acute, intense type of disease, the complications have, as a rule, been less than in the more prolonged diseases, such as typhoid fever, and even such complications as arthritis, pericarditis and meningitis seem to occur less frequently than even in the recent past. The many occasions on record in which the disease has appeared in epidemic form, and the instances of its development by direct contact, would unquestionably place it in the acute, infectious class, and its seems only a matter of time until health authorities will demand its isolation as in the case of scarlet fever or diphtheria.

TABLE I

	PNEUMONIA—525 CASES
Age Groups	Cases
1 to 5	
5 '' 12	
12 " 30	
35 " 50	
50 " 70	
70 —	
Sex:	
Male	
Crisis	
* .	
	tion—(1929-30)
Delayed resolut	ore 24
Delayed resolut Pneumonia befo	ore
Delayed resolut Pneumonia befo Admitted for a	ore
Delayed resolut Pneumonia befor Admitted for a	cute abdominal conditions 2
Delayed resolut Pneumonia before Admitted for a Average days in Result:	cute abdominal conditions 2

TABLE II

Area Involve	ea
Left upper lobe	32 or 6 per cent
Left lower lobe	
Right upper lobe	97 " 20 "
Right lower lobe	194 " 38 "
Right middle lobe	32 " 6 "
Bilateral	41 " 8 "
" cured	7 " 17 "
" died	34 " 83 "
	02 00

I	n	te	n	S	e	1	S	y	n	17	p	to	m	n	S					
Jaundice							*													
Delirium							*								*					2
Marked cyanosis			•		•			٠									٠	٠		3

			(Case	es		Deaths per cent	Low Cell Count per cent
Type	I,	35	or	15	per cer	nt	17	8
	II,	41	66	17	per cer		. 17	21
66	III.	24	66	10	66		50	26
66	IV,	138	66	58	66		. 26	14

^{*} Read before the Montreal Medico-Chirurgical Society April 20, 1931.

From the Medical Services of the Montreal General Hospital.

TABLE III

White Blood C	ells	
	Cases	Deaths per cent
Under 10,000	78	50
10,000—20,000 20,000—30,000	$224 \\ 99$	15
30,000—	32)	,
Blood Cultur	es	
Positive, cured		13
" died		
Negative, cured		
" died		
Blood Pressu	re	
High B.P. cured		26
" died		19
∫systolic		130 to 210)
\diastolic		80 " 110)
Low B.P., cured		191
" " died		52

Blood	Chemistry
Urea and creatinin	normal
Blood sugar average	0.153

systolic 110 and under

Opinions as to details of treatment have varied. For instance, the beneficial effects of cardiac stimulants, such as digitalis and strychnine, are debatable. Again, while intravenous salines may be of benefit, when the volume of blood is depleted, it would seem unnecessary to give glucose saline, since it has been shown that in the majority of cases, the blood sugar is already high during the disease.

While serum seems of undoubted benefit when given early, its use after several days have elapsed is open to question.

The following summary of the observations made in this statistical study may be of interest.

About one-third of all cases occurred between 30 and 50 years of age.

Over three times as many males were affected as females.

About 25 per cent of all cases admitted died. So that while pneumonia may be the "old man's friend", it certainly is the "young man's enemy."

Only about 4 per cent had had pneumonia previously.

One-quarter of all cases ended by lysis.

Only two cases were sent in with a diagnosis of "acute abdomen", and in these the right lower lobe was involved. This reflects great credit on the diagnostic ability of our physicians and surgeons.

The average number of days in hospital, up

TABLE IV

	Cases	Deaths
Pulmonary tuberculosis	8	2
Alcoholism	17	7
Syphilis	37	9
Chronic nephritis	4	1
Diabetes	3	1
Recent loss of weight-41 per ce	ent	

	-	C	01	n	p	li	ce	ıt	i	01	ıs	Cases	Deaths	
Albuminuria												316		
Effusion												14		
Empyema												12	7	
Meningitis												3		
Arthritis												0		
Pericarditis												3	2	

TABLE V

	Moru	ality Rates	
Year	Cases	Deaths	Per cent
1924	81	24	30
1925	96	23	24
1926	72	16	22
1927	97	26	26
1928	61	16	26
1929–30	118	28	23
Serum cases	77	7	10

to the end of 1928, was 19. In 1929 and 1930, the average was 21, while the average stay of those that received serum was 24 days.

About 50 per cent of the cases typed were in group 4.

The right lower lobe was involved in over 40 per cent of all cases.

About 6 per cent were bilateral, and over 80 per cent of bilateral cases die.

Many type 4 cases continued a septic type of temperature for eight or nine days after the initial drop.

Approximately 15 per cent of cases showed no leucocytosis.

In 187 blood cultures taken, 33 were positive, and over 63 per cent of those with positive cultures died; 27 of 154 with negative blood cultures also died.

The blood pressure frequently drops below normal, and this is not a favourable sign.

The average blood sugar in 46 cases tested was 0.153; only 7 showed a normal percentage.

A high blood sugar content in a case of diabetes with pneumonia does not necessarily mean severe diabetes, as the percentage of sugar usually falls with the temperature. Two-thirds of all cases showed albuminuria. This existed, usually, only during the febrile period.

Only 19 cases in the 525 had an alcoholic history, but 7 of these died—a large percentage—over 36.

Of 28 cases, weighed on admission, 23 were found to be from 4 to 57 lbs. below their best weight, or an average loss of 17 pounds. A debilitated condition, would seem, then, conducive to the contraction of pneumonia. Those not showing recent loss of weight were young adults who had been recently subjected to extreme exposure.

Only one case developed lung abscess.

Only about 0.5 per cent developed meningitis.

Four cases had pericarditis, or less than 1 per cent. Three of these died—a mortality of 75 per cent.

The urinary chlorides, estimated in 148 cases, showed almost invariably, initial decrease, followed by increase. The initial decrease was most common in the type 4 cases.

The administration of serum, if given early, allays the symptoms and lessens the mortality, but does not necessarily lessen the duration of the disability.

Case Reports

A CASE OF INTRA-ARTICULAR DISLOCATION OF THE PATELLA

By A. W. FARMER, M.D.,

Toronto

Dislocation of the patella of the type described in this report is very rare, but the light which the history of this case throws on the mechanism of the injury seems to justify its publication.

The patient, a boy of eleven years of age, while riding a bicycle was struck by an automobile, and was thrown violently forward, in such a way that he struck his left knee with considerable force against the ground. Examination showed a small superficial abrasion on the anterior aspect of the knee joint just above the usual position of the upper border of the patella. This abrasion had very evidently resulted from scraping along the ground, the blow having been a glancing one, directed downward towards the shin. addition to this the joint was greatly swollen, the swelling being of an unusual shape, and mostly due to distension of the synovial cavity with blood. There was added to the usual fusiform enlargement a marked rounded prominence which projected forward at the level normally occupied by the lower border of the patella. Careful palpation showed that the patella was absent from its usual position, and that its place was taken by fluid. The patella was lying between the tibia and femur, and

the only portion of it that could be felt was its lower border which was directed straight forward. This produced the prominence noted above.

The x-ray picture fully explains the displacement. The patella was avulsed from the quadriceps tendon and rotated vertically downwards until the upper border dropped in between the tibia and femur. In this position it was so protected by the conformation of the bones that no manipulations, even under anæsthesia, could dislodge it. It became necessary, therefore, to open the joint. With the joint



Fig. 1

open it was a simple matter to rotate the patella back to its normal position. Before doing so, the parts were carefully inspected. It was seen that the patella was torn free from all its attachments except the ligamentum patellæ. Except that the patella had been ripped out of it, the quadriceps tendon was undisturbed. In the place normally occupied by it was a cavity into which the bone fitted accurately.

The subsequent history of the case was uneventful. Three months after the accident all evidence of the injury had disappeared, and the knee was restored to normal.

The mechanism by which this dislocation occurred in this particular case seems clear. The blow struck the anterior aspect of the knee with great force just above the patella and in a downward direction. When the blow struck the quadriceps tendon, therefore, the quadriceps muscle was stretched until the patella slipped down to a point where it no longer had the support of the femur behind it, and it then burst out of the tendon and lodged in the intercondylar fossa. When the force was removed the quadriceps tendon sprang back to the normal position, but the patella, now attached to nothing but the ligamentum patellæ, remained behind.

This case is published with the kind permission of Professor W. E. Gallie.

A CASE OF SARCOMA OF THE UTERUS*

By C. V. WARD, M.D.,

Junior Assistant in Gynæcology, The Montreal General Hospital,

Montreal

A girl, eighteen years of age, was first admitted to the Montreal General Hospital to the Gynæcological Service of Dr. H. M. Little, in 1928. She had never menstruated and for the previous three weeks there had been a dull ache in the right lower quadrant of the abdomen. Apart from the above complaints, the personal and family history were unimportant. The physical examination was irrelevant, except that the uterus was small, firm and

retroverted, and there was a small cystic mass in the region of the right appendages. The left appendages were normal. A clinical diagnosis of ovarian cyst was made and an exploratory operation performed when a small, benign cystic right ovary was removed by Dr. Little; the left ovary, which contained multiple cysts, was cauterized. The pathological diagnosis was benign cysts of ovary.

In March, 1930, two years after her first admission to the Montreal General Hospital, she was readmitted on account of irregular vaginal bleeding and leucorrhea of one month's duration. She had menstruated for the first time in her life for two days in February, 1930. Following this, there was some daily spotting until her admission to the hospital. Associated with these signs and symptoms there was lower abdominal pain. The uterus, as on her first admission, was small and firm with a mass of polypoid tissue protruding from the cervix. Dr. Little removed this tissue, which appeared to have its source at the internal os, with ovum forceps and curette. The pathological diagnosis was chronic cervicitis.

In August, 1930, the patient was again seen by Dr. Little, who found a recurrence of the polypoid tissue in the cervix. She had not menstruated since her previous admission. Under gas anæsthesia the polypoid tissue was again removed from the cervix. The pathological diagnosis was exudative endometritis. In November, 1930, the patient was admitted to the hospital for the fourth time with the same history as on her previous admissions and polypoid tissue was again removed from the cervix, after which the cervix was cauterized. The pathological diagnosis was acute and chronic endometritis.

As there was no improvement in her condition she was readmitted in January, 1931. At this time the uterus was found to be somewhat larger than on the previous admissions. The cervical canal was dilated and the uterine cavity curetted, when a large quantity of soft material was obtained, which had the general appearance and characteristics of tumour tissue. During the process of curettage, it was noted that the uterine wall was very soft. The pathological diagnosis from the curettings was "rapidly growing sarcoma, probably of the endometrial type."

^{*} From the Departments of Gynæcology and Pathology of the Montreal General Hospital.

A total hysterectomy was done. There were no adhesions, nor could any evidence of metastases be seen. The patient made an uneventful recovery and was discharged from the hospital after a period of two weeks. The pathological report reads: "The uterus was enlarged. Its serosa was smooth and glistening. No evidence of adhesions or tumour could be seen on the external surfaces. The uterine cavity was opened so as to expose it in its entirety. The cervical endometrium appeared to be entirely free from tumour. The remainder of the uterine mucosa was entirely replaced by tumour tissue. This tissue was jagged, very



Fig. 1.—Drawing of the opened uterus to show leiomyoma in the wall and extensive replacement of mucous membrane by tumour.

soft, pale, tore easily and was intimately associated with the musculature of the uterus, from which it could be dissected. In the upper third of the uterus there was a small leiomyoma embedded in the muscular wall. This leiomyoma had the gross characteristics of a benign tumour, and there was no evidence that the associated soft tumour tissue of malignant character had infiltrated it.'

Microscopic sections were made from the various portions of the uterus and stained with differential stains. There was no evidence of involvement of the cervical mucosa or of the cervical musculature with tumour. Elsewhere, the mucous membrane was entirely replaced by undifferentiated tumour cells, which varied in size and shape. The great majority of them were round. Tumour cells infiltrated the muscle

of the uterus from about two-thirds of its thickness.

No tumour cells were found in the most external portion of the uterine musculature. Sections taken through the leiomyoma did not show any sarcomatous cells within it, and there was no evidence that the tumour arose from the leiomyoma, which is microscopically a benign tumour. Differential stains failed to demonstrate the presence of myoglia fibrils. The general character of the tumour cells, and their relation to the mucosa and the musculature immediately beneath it, are in keeping with a tumour of the endometrial type. Diagnosis, endometrial sarcoma.

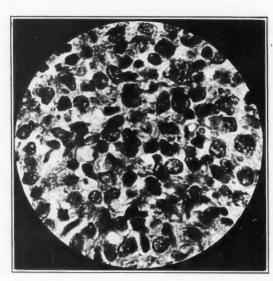


Fig. 2.—Photomicrograph, to show the type of cell in sarcoma of the uterus. The cells are many and stain deeply; there are many mitotic figures. (oil-immersion).

Since discharge the patient developed metastases in both lungs and in the intestinal tract and died in March, 1931.

A great deal has been written upon sarcoma of the uterus since Mayer's description of it in 1860. Viet, Williams and others have contributed excellent articles on the subject. In 1923, Masson, of Rochester, Minn., published an article which carefully reviewed the literature and discussed the pathology. Sarcoma may arise either in the cervix or in the body of the uterus and in either place may have its primary source in the endometrium or in the muscularis. When sarcoma arises in the muscularis, in the great majority of cases it is primarily either in the muscle itself or in a pre-existing leiomyoma. Like sarcoma elsewhere, there is a good deal of variation in the cell type. As a

rule, the more malignant the tumour is, the greater is the diversity of cell type. It is not uncommon to see mononuclear cells in comparatively large numbers. Sarcomata of the uterus arising in the mucosa are usually of a polypoid type and, owing to interference with their circulation, become necrotic early. Sarcomata arising from the endometrium are not so common as those arising from the muscularis; this is fortunate, because the former are more malignant, metastasize earlier and more diffusely than the latter.

The prognosis in sarcoma of the uterus depends partly upon its site and partly upon its type. As a rule, these tumours, as a group, grow more rapidly than carcinoma. Sarcoma of the cervix, according to Curtis, nearly always recurs; therefore, a radical operation is often useless. In sarcoma of the body the prognosis is better, particularly if there is no involvement of the parametrium, but yet is far from good. The prognosis in endometrial sarcoma is poor because metastases occur in distant organs very early.

The only treatment which offers any hope, according to Graves and Curtis, is panhysterectomy, as radium has not proved effective in sarcoma of the endometrial type and is contraindicated in any degenerating fibroid.

ACUTE TRANSVERSE MYELITIS COMPLICATING MEASLES

By F. G. MILLER AND A. G. Ross, Elk Point, Alta.

In December, 1926, a rather severe epidemic of measles occurred in the "Yankee" School District, twelve miles southeast of Elk Point, Alberta.

On the night of December 18th a call was received from a family in the district to attend a Norwegian girl, aged 11. When seen first the child was lying on her left side with her knees drawn up and crying on account of pain in the upper lumbar region. She had been sick since the 15th, but without lumbar pain till the 18th. Her face, trunk and extremities were covered with a blotchy, deep rose-coloured eruption. Her tongue was coated and she had a mild conjunctivitis and definite photophobia. Koplik spots

were evident in the usual position; temperature 103°, pulse 130. She coughed frequently, but both lungs seemed clear on percussion and auscultation. The heart was regular; no enlargement, no murmurs. The abdomen was negative. The spine and the deep tissues on both sides of it were tender to pressure in the upper lumbar region.

Five gr. of aspirin and 3 gr. of phenacetin gave relief for about three-quarters of an hour. A specimen of urine was free from albumin, sugar and pus.

Two brothers, aged 9 and 15 respectively, were sick in the house with ordinary attacks of measles.

On the night of the 19th a second call was received from the same case. The pain in the back was worse, in spite of repeated doses of aspirin and phenacetin. A specimen of urine could not be obtained at this time, but she had voided freely about an hour previously. On the morning of the 20th she was again visited, and catheterized as she was unable to void. That afternoon she was brought to Elk Point Hospital. On admission, she was complaining bitterly and frequently of pain in the back. Her temperature was 102°, pulse 120, respirations 28. There was frequent loose cough and complete paralysis of both lower limbs. She required regular catheterization and her bowels moved involuntarily. The knee jerks and plantar reflexes were absent.

On December 25th the cough was weak. She had difficulty in raising sputum. There was definite paresis of both arms. She was very restless and constantly complaining; temperature 100°; pulse 120 and of very poor quality. She seemed about to die.

December 28th.—She seemed slightly stronger; pulse 100 and of better quality; cough improving; the rash had disappeared. December 31st—Paresis of arms was much improved.

January 3rd.—No paresis was evident in the arms; the knee-jerks beginning to return, most noticeably on the right. Babinski's sign was present on the right foot. January 11th—Urination involuntary. January 15th—Slight voluntary movement of the right ankle and the toes of both feet was possible. January 24th—She could move the right knee, ankle and toes, slightly. The knee-jerks were both present; slight voluntary movement of the left ankle and toes. She

voided involuntarily, and knew when the bowels wanted to move, but could not control them.

The girl was discharged at this time. A report two months later from her parents stated that she had regained control of her rectum and partial control of her urethral sphineter. Examination was made April, 1929, two and one-half years after the attack. She had grown normally, had complete control of sphineters, could walk freely, although with a slight irregularity of gait. She could run on level ground, but was apt to stumble if the ground was at all rough. When erect she stood with her knees slightly sprung forward and complete active extension of the knee joints was impossible.

This would appear to have been a case of acute transverse myelitis complicating measles.

SEVEN CASES OF TYPHOID FEVER IN ONE FAMILY, WITH UNUSUAL COMPLICATIONS*

BY SAUL J. USHER, M.D.,

Montreal

I am reporting these seven cases of typhoid fever because such a series in one family is without parallel in the literature, especially when accompanied by such unusual complications and high mortality. Even in the epidemic of 1927 in Montreal, when approximately 5,000 cases were reported, there was no one family so severely attacked. family in question consisted of the parents and eight children, the youngest being 3 years old, and the eldest 17 years. Both parents and one child escaped, the father having had typhoid fever many years ago, and the mother and child having received a protective inoculation. The source of the infection was difficult to determine. The oldest boy was employed on a small produce farm just outside the city, and returned to his home in the city every evening. He washed the celery from the farm in a barrel of water sunk in the ground. The water was surface water from a small spring. This water, when examined later, although free of B. coli, was greatly contaminated. At approximately the same time, during the months of

September and October, a small outbreak of typhoid fever occurred in Montreal. This was traced to a dairy plant operating in the north end of the city, where all the milk was supposed to be pasteurized. Although the family took no milk from this dairy, the eldest boy, who was fond of ice-cream, may have eaten some which they had manufactured. A brief review of each of the seven cases follows. Three of these cases were treated at the Children's Memorial Hospital, three at l'Hôpital St. Justine and one at Notre Dame Hospital.

CASE 1

M. M., a boy, aged 17 years, was admitted to the Notre Dame Hospital on October 23, 1930, and discharged January 29, 1931. The onset was eight days before admission, with headache, nose-bleeds, anorexia, and constipation followed by diarrhea. He ran a very toxic course with delirium and incontinence of urine and fæces. There was persistent abdominal distension. The Widal test was negative on October 27th, and was positive when repeated on November 17th. The temperature remained high for two months, gradually falling to normal on December 12th. Numerous skin abscesses developed during the course of the disease, and they were especially severe over the buttocks. Paralyses of the extensors of both feet also developed, this gradually improving during the protracted convalescence. The treatment was mainly supportive, glucose solution being given intravenously.

CASE 2

L. M., a girl, aged 9 years, was admitted to l'Hôpital St. Justine on October 24, 1930. Onset ten days previously with headache, nosebleeds and diarrhea. There was a positive Widal test on October 28th and both typhoid bacilli and streptococci were found in the blood steam. She appeared very toxic and a distressing cough was present. The pharynx was markedly congested, but no false membrane was visible. The abdomen was distended and fairly rigid, and she was almost constantly delirious. Some dyspnæa developed and a culture from the throat on November 8th was doubtful for B. diphtheriæ. A direct smear the day before showed streptococci. Twenty thousand units of diphtheria antitoxin were given

^{*} From the Children's Memorial Hospital, Montreal.

on November 8th, 10,000 units on November 10th, and 10,000 units on November 18th, without improvement. The breathing became steadily more laboured, with the appearance of cyanosis, and she was intubated on November 10th. Masses of membrane were removed and there was temporary relief. This was short lived, and she became steadily more dyspnæic and prostrated, dying on November 21st. The day before death, a direct smear from the throat showed diphtheria bacilli, spirochætes and fusiform bacilli. The culture was also definitely positive for B. diphtheria. autopsy was performed and the summary of the findings is as follows: pulmonary abscess, probably gangrenous; myocarditis; infectious nephritis; meningo-encephalitis; streptococcic septicæmia; typhoid fever; diphtheria.

Case 3

S. M., a girl, aged 5 years, was admitted to l'Hôpital St. Justine on October 24, 1930. Onset eight days previously, with nose-bleeds, headache and diarrhea. There was a positive blood culture and a negative Widal test on October 27th. Throat cultures were negative for B. diphtheriæ. The child was in a very toxic state. Numerous superficial infective lesions of the mouth, nose and cheek appeared. There were hæmorrhages from the nose and ears. A culture of the throat on November 9th was doubtful for B. diphtheria, and 10,000 units of diphtheria antitoxin were given, with no improvement. Prostration became increasingly marked and she died on November 10th. No autopsy was performed.

CASE 4

C. M., a girl, aged 3 years, was admitted to l'Hôpital St. Justine on October 26, 1930. The onset was a week before with diarrhea, headache and cough. She appeared very weak and toxic. There was a negative Widal on admission which became weakly positive on November 1st. The throat culture was negative for B. diphtheria. The temperature remained steadily high and there was a frequent cough and diarrhea during the course of the illness. She became dyspneic on November 7th and this trouble became increasingly severe. A direct smear of the throat was positive for B. diphtheriae on November 9th, and 10,000

units of diphtheria antitoxin were given subcutaneously and repeated on the following day, without any improvement in the child's condition. Intubation was done on November 10th and gave very little relief. Dysphagia was present for a few days before death. She died on November 10th. No autopsy was performed.

CASE 5

G. M., a boy, aged 12 years, was admitted to the Children's Memorial Hospital on November 26, 1930, on the fourteenth day of his illness, with a temperature of 104° and a pulse of 120. He appeared very ill, was delirious a great deal of the time, and took feedings and fluids very poorly. The pharynx was very congested and there was a muco-purulent post-nasal discharge. Repeated throat cultures were negative for B. diphtheriæ. The blood and stool cultures were positive for B. typhosus on November 29th. On December 1st he had a hæmorrhage from the bowel which was so severe as to require transfusion. A few days later the hæmorrhages recurred and he was given another transfusion. From then, until he died on December 8th, he had occasional small hæmorrhages. He developed an extensive furunculosis of the scalp and two days before he died was thought to have a bronchopneumonia. The autopsy showed typical typhoid lesions of the bowel, empyæma and evidences of septicæmia.

CASE 6

T. M., a boy, aged 41/2 years. This case has been described in full in another article.1 Briefly stated, he was admitted to the Children's Memorial Hospital on November 26, 1930, on the sixteenth day of his illness in a He was greatly undervery toxic state. nourished and had a severe cough. The lips were excoriated and dry, the tongue dirty and coated, the breath foul and the tonsils very large and congested, with considerable mucus in the throat. Numerous moist râles were heard all over the chest. On November 28th the right cheek appeared moderately swollen, and a small black ulcerated area was noticed on the inside of the cheek, the beginning of a typical cancrum oris or noma. This rapidly spread in spite of two intravenous injections of novarsenobenzol and local applications of the same. By December 4th there was a circular area of necrosis on the cheek measuring about 2 cm. Smears showed numerous spirochætes and fusiform bacilli. This was widely excised two days later, the margins cauterized, and local applications of acriflavine and gentian violet solution applied. The gradual extension of the process on the inside of the cheek had involved the gums and the inferior maxilla on that side. There was gradual healing during the following two months and a plastic repair of the cheek was finally done. The child was discharged on June 17, 1931.

CASE 7

E. M., a girl, aged 7 years, was admitted to the Children's Memorial Hospital on November 29, 1930. She had received an inoculation against typhoid fever a week before admission. A day or two following the inoculation she began to feel ill. On November 28th she became much worse, complaining of headache, malaise, fever, diarrhea and a slight cough, On admission, she appeared only moderately ill, and after an uneventful course for two weeks her temperature, which had been high for the first ten days, gradually settled down to nearly normal. On December 22nd she developed a moderate attack of scarlet fever which subsided without any complications. During her convalescence she contracted varicella from which she made an uneventful recovery.

In addition to the seven cases described above, one of the nurses at l'Hôpital St. Justine who was in attendance on the three typhoid patients, developed a fulminating attack of the disease on November 21st and died on December 21st.

DISCUSSION

Mixed infections occur with great frequency in typhoid fever. This is not remarkable, since the intestinal ulcers, the frequent ulceration of the mouth, and the bedsores afford favourable ports of entry. Vincent,² in mixed cultures of the typhoid bacilli with staphylococci or streptococci, observed the greatest difference in the influence of these two pyogenic organisms on the typhoid bacilli. The staphylococcus is remarkably inimical to the growth of the

typhoid bacillus, while, on the contrary, the typhoid bacillus grows vigorously when mixed with the streptococcus. In Case 2, there was an associated streptococcic septicæmia early in the disease, which proved fatal. A staphylococcic septicæmia was a terminal event in Case 5, the organisms probably gaining entrance through the extensive furunculosis on the scalp. Laryngitis is a very dangerous complication, and is usually associated with a particularly severe infection. In a report of 175 cases in children several years ago,3 there were two fatal cases of ulcerative laryngitis. A very unusual and interesting complication is that of a specific diphtheritic laryngitis, such as occurred in Cases 2 and 4. The coincident occurrence of diphtheria and typhoid fever, particularly during severe epidemics, is mentioned frequently by the older writers. The throat condition was probably one of diphtheria in the older anatomical sense. Osler,4 with all his vast experience with typhoid fever, states that he had personally not seen diphtheria, in the current etiological sense, as a complication of typhoid fever, and that such cases were extremely rare and required exact bacteriological investigation. He warned especially against confusion with the specific typhoid angina. In a careful survey of the literature, I have been unable to find any report of such cases. It is difficult to surmise in what manner the diphtheria infection in Cases 2 and 4 was contracted. There were no other cases of diphtheria in the hospital at the time. It may have been that these children were carriers, and their resistance being greatly undermined by the typhoid fever, the diphtheria bacilli became virulent. It is interesting to note that the large doses of diphtheria antitoxin given had not the slightest effect on the course of the disease. These children received very little relief from intubation. Keen⁵ believes that tracheotomy is the best treatment in the laryngeal complications of typhoid fever, as it affords much greater relief than intubation. The occurrence in Case 6 of such an unusual and fatal condition as cancrum oris with complete recovery following treatment is of great interest. Case 7 was the only mild case in the She had been given a preventive family. inoculation against typhoid fever, probably while incubating the disease.

SUMMARY

An extremely virulent infection of typhoid fever is reported in seven children in one family, with four deaths. Of the four fatal cases, one had an associated streptococcic septicæmia and laryngeal diphtheria; the second died from the severe toxæmia; the third developed laryngeal diphtheria as a complication; and the fourth developed severe intestinal hæmorrhages and a terminal staphylococcic septicæmia. Of the three patients who recovered, one had a mild attack, due to a

prophylactic inoculation while incubating the disease; the second had a very toxic and prolonged attack, and developed paralysis of the extensors of both feet; while the third developed cancrum oris and was operated upon and later had a plastic repair done.

REFERENCES

- 1. USHER AND Ross, Canad. M. Ass. J., 1931, 25: 446.
- 2. VINCENT, Ann. de l'Institut Pasteur, 1893, 7: 141.
- 3. USHER, Canad. M. Ass. J., 1927, 17: 1486.
- Nothnagel's Encyclopedia of Practical Medicine, Typhoid and Typhus Fevers, Saunders, Phila., 1910.
- Keen, Surgical Complications and Sequels of Typhoid Fever, Saunders, Phila., 1898.

Editorial

DIET AND THE TEETH

NE sometimes hears the statement that the teeth of our progenitors of, say, a generation or two ago, were better than ours. If this be so, and it is not unlikely, we are impelled to look for an explanation. It could not be that the hygienic conditions of life were better in the past, for this is not so. At no time has the standard of living been higher than of late years. It must, then, be a question of diet. Certainly the food of our forbears was simpler and more natural, while we have gone in for refinements and canned goods. In favour of this conclusion a considerable amount of evidence has recently been accumulating. We have in mind the important and convincing work of Mrs. May Mellanby, who has put the matter to the test of experiment. The results of her studies on the influence of diet on the formation and preservation of the teeth have now been published in three parts by the Medical Research Council of Great Britain.1 The first part dealt with dogs; the second part with such subjects as the effect of diet on periodontal changes in dogs; on dental caries and its relationship to nutrition in dogs, rabbits, rats and monkeys; and the factors influencing calcification in the jaws of rabbits and rats. The third part deals with man. Some of Mrs. Mellanby's findings are as follows.

 Medical Research Council, Annual Report for 1927-28. His Majesty's Stationery Office, London, 1929. *Ibid.*, Special Report Series No. 153: 1930, page 94. *Ibid.*, Special Report Series No. 159: 1931.

A deficiency of vitamin A in the diet leads to hyperplasia of the subgingival epithelium, which renders it vulnerable to the attacks of microorganisms. Here we have a promising hint as to the cause of pyorrhœa. Deficiency of vitamin D leads to defects in the alveolar bone. Furthermore, it would appear that defects of this kind in the dietary are of more importance in the early period of life than later. Again, the response of the tooth to attrition seems to depend on the amount of vitamin D. When the enamel of a tooth is destroyed the osteoblasts of the pulp become active and secondary dentine is formed. A dietary containing an abundance of vitamin D ensures that much well-calcified secondary dentine will be formed; a dietary deficient in this particular, such as cereal, causes the production of badly calcified dentine or none at all. With an abundance of vitamin D the teeth are properly formed. The situation in regard to dental caries seemed to be somewhat harder to appraise. On the whole, the tendency to caries was less evident when there was an abundance of fat-soluble vitamins in the food.

These conclusions appeared to be so important that it was thought desirable to test them out in the human subject. This phase of the research was carried out on a large scale at Birmingham from 1927 onward, and the findings were so promising and important that it was deemed advisable to publish them in the form of an Interim Report. The

investigation was carried out under the supervision of Mrs. Mellanby and Doctor Langdon, its object being to determine the influence on the teeth of the addition of vitamin D to the dietary of children living under uniform conditions.

Eight hundred and thirty-five children, ranging in age from two and a half to sixteen years, living in residential institutions, were used for the test. Four hundred of these were kept under continuous observation. Two series of investigations were made. In the first, three groups of children, each living in a different institution, were studied. They were on the regular diet, with certain additions. One group received about one ounce of treacle daily; the second, about half an ounce of olive oil; and the third, about half an ounce of cod-liver oil. In the second series two groups of children in the same institution were compared. One of these groups received olive oil, and the other, olive oil plus irradiated ergosterol. The teeth of the children were examined every six months over a period of two years. following quotation gives the gist of the "In groups of children, numbering from sixty-five to eighty-six, living under similar institutional conditions, each group receiving a certain specific addition to the standard dietary, over a period of two years,

the progress of caries in the permanent teeth has been significantly retarded in those children receiving an added ration of fat-soluble vitamins as compared with those whose additions consisted of treacle and olive oil respectively; the increase of caries in the vitamin group, whether measured by its incidence or its extent, being approximately one-third that in the other groups." In the case of the second series of investigations the administration of irradiated ergosterol produced a correspondingly favourable result.

It is evident, therefore, that a sufficiency of vitamins A and D in the dietary is a sine qua non if the teeth are to maintain an efficient resistance to the inroads of caries, and it is evident, also, from the earlier part of the investigation, that it is in early life, in infancy and the earlier developmental period, that the character of the diet is of the most importance. When the permanent teeth are fully erupted diet has much less influence. It further appears that cod-liver oil, or its substitute, irradiated ergosterol, is an efficient means of furnishing the vitamins necessary for the proper development and preservation of the teeth. At last we have experimental proof of a view that, from a priori considerations, seemed reasonable.

A.G.N.

THE HARVEIAN ORATION

HE Harveian Oration, founded by the Royal College of Physicians of London, is an annual event. To be chosen as Harveian Orator is a great honour, yet one that has its drawbacks. The records and writings relative to Harvey, at present available, have been so thoroughly combed by the various Orators that it becomes increasingly difficult to find anything new to say. Old material must to some extent be rehashed, though it is still possible to present it in a new setting and with new connotations. The Orator for 1931, Dr. Robert Hutchison, has succeeded to admiration in his difficult task. As in duty bound, he has fulfilled the injunction to analyze the character of Harvey and to exhort the Fellows, in Harvey's name, that they continue in love and affection amongst themselves, and he has done this with a wealth of learning and apt quotation. As others have done before him, he has found the outstanding characteristics of Harvey's character to be love of truth, reverence for Nature, which seems to mean to him the same thing as reverence for the Creator, charity, using the word in the scriptural sense, imagination, not very conspicuous, and a sense of humour.

At this point Doctor Hutchison takes a line of his own that is full of wisdom and provocative of thought. He asks "What part does personality play in the highest scientific work?" We may quote. "In art, of course, the personality of the artist is everything, and the same is true in literature—the style is the man himself. But in the case of science the influence of personality is

not so obvious. There is a tendency, indeed, to regard scientific men as a sort of robots, who discover facts and laws by a purely intellectual process with which character has nothing to do. This, surely, is too narrow a view. Truth is as many-sided as human nature and requires the whole man to discover it. The great scientist must not only love truth as Harvey did, but he must have a feeling also for the beautiful and for the good. For truth is perceived by the emotions as well as by the intellect, and the poet and the discoverer are to some extent one." This same thought was emphasized by General Smuts in his presidential address before the British Association for the Advancement of Science this year. Doctor Hutchison proceeds to contrast the spirit of the age of Harvey with that of today. Like Harvey "we live in a period of great unrest, political, social, and economic, but in our own age there has been a destruction of values, a throwing down of standards, and a removal of moral and intellectual landmarks of which the seventeenth century knew nothing. The effect of the moral and intellectual chaos of our age has been disastrous to the arts and to some extent to literature, but it has not vet affected science." The popularity of science with all men, particularly on its practical side, however, brings its own dangers. "What we have to fear is the influence of the massmind, of the increasing importance attached to quantity rather than to quality in life, the undervaluation of knowledge for its own sake, and the exploitation of discovery for commercial ends. We may suffer also from the deflection of science by the pull of the politician, the philanthropist, and the press."

Doctor Hutchison also touches on a matter that is becoming increasingly insistent for a solution—the accumulation of books and monographs in our libraries. Our libraries are also mausoleums. He proposes a moratorium for five years to enable us to digest the material before us. He does not suggest, however, that we should burn the authors with their works as they used to do in "the good old days!" There is clearly, in Doctor

Hutchison's opinion, too little speculation and too little use of the imagination, and, compared with the wealth of knowledge and the brilliance of observation which it exhibits, most scientific literature is barren in ideas. There are many who think the same, but the remedy is not just to hand.

Doctor Hutchison draws most interesting analogies between the medicine of the present day, which has been called "constitutional medicine," the science of the individual, or "neo-humoralism," but which he prefers to call "neo-Hippocratism," and that of the Hippocratic era. These analogies are close. The present day emphasis placed on the fluids of the body, the interaction of the chemical substances they contain, the influence of the hormones, the integration of the animal body brought about by the circulation of the blood, Harvey's great discovery, bring us in contact, though in a scientific way, with the old doctrine of the "humours," and the insistence of the Hippocratic school on the vis medicatrix natura finds its echo in medical thought at the present time. True it is that the old Greeks, despite their lack of experimental data (though, perhaps they had more than we give them credit for), were fertile in ideas, and in medicine, as well as in the arts and literature, we are beginning to acknowledge our debt to them.

Doctor Hutchison, finally, makes a plea for thinking. "Observation and experiment can give us facts, have, indeed, given us too many facts. What we require is men with imagination, men of the contemplative type of Harvey, fertile in hypotheses, who can see the inter-relation between the facts and who can bind them into manageable sheaves and induce from them those generalisations which we call natural laws."

All this is put in the Orator's incisive style, with strong conviction, and with telling effect. There is much food for productive thought and we cannot do better than recommend our readers to study the Harveian Oration for 1931 as it is given in extenso in The Lancet for October 24th.

A.G.N.

Editorial Comments

On Head Nodding (Spasmus Nutans) in Infants

In an interesting paper in a recent issue of The Lancet (1931, 2: 736) Drs. Donald Paterson and R. W. B. Ellis discuss the etiology of spasmus nutans or head nodding, The clinical picture is a charin infancy. acteristic one. A pale and generally rachitic baby of the hospital class, who shows no abnormal head movements when lying flat in the cot, if sat up, commences regular anteroposterior or lateral head movements, accompanied with a peculiar type of nystagmus. The condition arises during the early months of infancy, the period in which the infant is learning to control and coordinate his ocular movements by means of visual impressions. The condition has been described by Thomson as a functional coordination neurosis. In considering its etiology it has been noted that in addition to its association with rickets, its onset occurs most frequently in the darkest months of the year, and in children living in defectively lighted rooms. Raubnitz, in 1897, first suggested defective light as the principal cause although this suggestion has been criticized by Still, who reported a series of cases occurring in rooms which appeared reasonably light, but made no reference to the effect of the glare of skylights or of divided lights. The writers compare the condition with that of miners' nystagmus, and consider the possibility of this spasm developing in children exposed to any direct dazzle from light entering directly above the cot of the child. A generally accepted theory of miners' nystagmus is that in a dim light the eye must move 15 or more degrees from its mid point to obtain the image of an object, since the retina functions by means of the rods rather than the cones, and no rods exist at the fovea centralis. The nystagmus of head nodding, they consider, is closely comparable. Four cases are reported in which infants who have been kept in dim light for a considerable time developed the symptoms. Three of the children occupied basement rooms, and the fourth a back room dimly lit by a window facing an adjacent wall. In each infant rickets was also present, and recovery gradually took place as the rickets improved. The writers protest, however, against the entire credit of the recovery being given to antirachitic treatment. The condition of head nodding is self-limited, and it is probable that an increasing power of coordination is developed with increasing age, but in the opinion of the writers defective illumination in the bedroom is also an etiological factor.

The Permeability of Textile Fabrics to Ultra-Violet Rays

Considering that our bodies, at least those of the male sex, are heavily and almost completely covered with clothing, and particularly so in winter, it is a matter of practical concern to know what resistance various textile fabrics offer to the passage of ultra-violet rays. Very little of the skin of the body, proportionately, is exposed to the sunlight at any time, and, furthermore, during the winter months the content in ultra-violet rays is reduced to a minimum, so that it would be a great advance if some fabric could be discovered which would adequately transmit these health-giving rays. It would appear, however, that we are still far from this consummation so devoutly to be wished.

An authoritative statement regarding this subject can be found in the Report by Coblentz, Stair, and Schoffstall, which appeared in the Bureau of Standards Journal of Research, of the United States Department of Commerce, (1928, 1: 105). These investigators studied not only the powers of the various textiles in this particular-linen, cotton, viscose and acetate artificial silk, real silk, and wool-but also the influence of weave, dyeing, bleaching and discoloration from age. Comparing materials having the same weight, they found that there is practically no difference in the amount of ultraviolet rays that could pass through bleached samples of linen, cotton, viscose and acetate artificial silk. Fresh white natural silk is almost as permeable as bleached cotton, while wool is only about half as permeable. In all cases when the fabric was dyed the transmission of ultra-violet rays was greatly impeded. For example, in the case of acetate artificial silk the percentage transmission of ultra-violet rays was reduced from 20 to 2. We gather from these studies, further, that it is the weave that counts rather than the material of the textile. That textile which has the largest openings between its threads transmits the most ultra-violet rays. Unfortunately, such fabrics are inadmissible in winter, when they are actually most needed.

A.G.N.

The Veterinary Journal

The October number of the Veterinary Journal, which is a monthly review of veterinary science, edited by Frederick Hobday, C.M.G., F. R. C. V. S., F. R. S. E., Honorary Veterinary Surgeon to His Majesty the King, has just reached us. This issue is devoted specially to physiology, and contains a number of valuable articles. These are "A Brief Note on the Diag-

nosis of Equine Pregnancy by Biological Test," by F. A. E. Crew, W. C. Miller, and J. Anderson, of the Institute of Animal Genetics, Edinburgh, in which a modified Zondek-Ascheim test is applied to the case of cattle, with, the authors conclude, satisfactory and encouraging success; "The Co-ordination of the Reproductive Processes," by A. S. Parkes, Foulerton Student of the Royal Society, dealing with the hormones of the ovary and pituitary body; "The Regulation of the Acid-Base Balance of the Body," by F. W. Lamb, Victoria University, Manchester; "Stores of Blood," by J. Barcroft, Cambridge University, in which the experimental evidence for the theory that blood is stored in the spleen, liver, and papillary vessels of the skin, is reviewed; "The Reticulo-Endothelial System," by A. Piney, Director of the Cancer Hospital, London, in which the nature and the function of the system are discussed. There are also clinical articles on a "Mummified Fetus in the Cow''; "The Gall-Bladder"; and "Vomiting in Ruminants." Most of these subjects are discussed in their veterinary bearings, and are helpful in providing links between human and veterinary medicine.

In an editorial prefacing the issue the Editor bewails the fact that none of the veterinary colleges in Great Britain possesses a Chair of Physiology which is filled by a graduate in veterinary science. We are a little better off in Canada in this respect, but not much. There are only two veterinary colleges in the whole of Canada, the Ontario Veterinary College at Guelph, Ont., and the veterinary department of the University of Montreal, at Oka, P.Q. In the former of these, at least, a veterinarian teaches physiology. It is much to be desired that veterinarians should receive adequate training in the so-called "basal" medical sciences, not only physiology, but physics, chemistry, and biochemistry as well. If they do not, they are undoubtedly handicapped in their handling of veterinary problems of a laboratory or research character. In fact, prospective veterinarians would be well advised to take the two preliminary years of the medical course. After this they would be well equipped to deal with their own special problems. Actually, the two professions of human and veterinary medicine are coming closer together, but it is from little conscious effort on their part. It is merely because certain diseases common in the lower animals are, on occasion, transmitted to mankind. We learn that the University of Toronto, with which is affiliated the Ontario Veterinary College, has instituted courses for the degrees of B.V.Sc., M.V.Sc., and D.V.Sc., the first named being awarded after the regular curriculum at the Ontario Veterinary College, the other two being awarded on the completion of advanced work. This cannot fail to enhance the standing of the

veterinary profession as a scientific body, and will be, in time, reflected in the output of firstclass research work and, we may hope, in the discovery of new and important facts. Both professions, indeed, have need of one another.

A.G.N.

Bendien's Test for Cancer

In the September issue of our Journal is to be found an editorial dealing with a new spectrophotometric test for cancer, devised by Dr. S. G. T. Bendien, of Zeist, Holland. At that time the medical world was all eagerness, for the new test promised to be of great value, though it was realized that much more work would have to be done, and by other workers, before full appraisal could be reached. We regret to have to say that this early promise cannot be sustained. As with most new tests, scattered reports had been received which were favourable. These were based, however, on very slight investigation. Now we are told by Sir Charles Gordon Watson, Chairman of the Investigation Committee of the British Empire Cancer Campaign, that although the preliminary results obtained with the test were encouraging further inquiry by the Committee has led them to the conclusion that Bendien's test, at the present time, cannot be accepted as a reliable diagnostic measure. It is to be hoped that the matter will not be allowed to rest here. Bendien may still be on the right track, and some modification or adaptation of his method may yet be found to meet the indications. The idea that there is some constitutional vitium which influences the local development of cancer, while not original with Bendien, is one that has much to support it, and should be followed up.

A.G.N.

The McGill Medical Undergraduate Journal

We welcome to our desk the first number of a new journal produced by the undergraduates of the McGill Medical Faculty. This issue is mainly devoted to a consideration of medical education and presents a simple, dignified appearance that is very pleasing. The principal articles in it are "The McGill Medical School of the Past, 1825-1920," by H. P. Macey; "Medical Education in Germany and Austria," by John V. V. Nicholls; "The French Viewpoint on Medical Education," by J. S. Smit; "Medical Education in the United States," by Clement C. Clay; and "Medical Education in the United Kingdom and the Irish Free State," by William d'A. Maycock. Besides these there are a case report, some impressions of hospital work, some "potry," a short story, and a more ambitious article on "Artificial Pneumothorax in Pulmonary Tuberculosis," by Gordon Lynch. There are also some excellent reviews of recent books.

We quote the following from the editorial that introduces the new journal, as it embodies an important statement of policy which appears to us entirely commendable. "It is also worthy of note that the Journal is built entirely on the efforts of Undergraduates, and makes no attempt to copy or usurp the place now held by the various specialized medical journals." We take this to imply that the new journal will be written, in the main, by the students themselves, and that they will not depend upon their teachers to provide the scientific pabulum. This is entirely as it should be. In fact any other policy would, in the end, prove suicidal. small magazine, having chiefly a local interest, and with a limited circle of readers, cannot cope with the larger publications that count their readers in thousands and, therefore, possess a wide appeal. In fact, the chief value of journals like the McGill Medical Undergraduate Journal is to the students themselves, and this is, or can be, great. There is an old reproach, which we have seen in print, that of the three learned professions the medical men are the worst edu-The truth of this, of course, depends somewhat on what we mean by "education." If it means an inability to express ourselves properly in speaking and writing the criticism is, generally speaking, a fair one. As the years pass, however, we are glad to say that things are improving. We are, let us hope, getting back to the days of Oliver Wendell Holmes, Conan Doyle, John Brown, and Weir Mitchell, to mention only a few great names. And our hope is fixed on the on-coming generation of medical men, the present-day medical undergraduate. The various journals put out by the students of our universities afford these students an opportunity that is invaluable and should not be ignored. We would say to medical under-graduates, in all sincerity— "Write for your journal, and give it of your best." Those who feel that they have no gifts in this direction, or that they cannot develop them, should at least subscribe and so help a good cause. Out of the many will emerge, possibly, some whose literary efforts may even be classed as literature.

We would here put in a plea for the editor. It is related that a country correspondent once wrote to the editor of a newspaper as follows:-"Dere sir, enclosed plese find a pome which I hope you will find acceptible for your valuable paper. Does the editor attend to the spelling and punctation, or must the author do it.' Now editors, good editors that is, have the Midas-like faculty of transmuting dross into gold, but their labours are rendered much easier if the copy submitted to them is properly spelled, well punctuated, and logically arranged. A good literary style is desirable, but these other matters are essentials. Men with scientific training, of all men, should be able to discern fully, to think logically, and to express themselves simply, clearly, and directly. All this will not be attained at once, but will come with practice. In this, as in other things, practice makes perfect. This fatherly advice is passed on without charge to all of our profession who desire to reach the ears and eyes of their compeers with effect. We congratulate the medical students of McGill on the initial success of their venture and offer them our best wishes for the future.

A.G.N.

Erratum

Dr. L. J. Carter wishes us to draw attention to an error which appeared in his paper, entitled "The X-Ray Treatment of Uterine Hæmorrhage and Uterine Fibroids," which appeared in the November issue of the *Journal*. On page 583, first column, line 17, the word "some" should be "none". We regret this mistake.—Ed.

PITUITARY THERAPY OF ALOPECIA: PRELIMINARY REPORT.—Five years ago, while Bengt Norman Bengtson was resident at the Research and Educational Hospital of the University of Illinois, a woman with Fröhlich's syndrome was treated with various pituitary preparations. During the treatment, she developed a luxuriant hair growth, in addition to regaining her normal sexual desires, re-establishing her menstrual cycle, and losing weight. The growth of hair was particularly remarkable in that the patient and her immediate female relatives (mother and two sisters) all had, since early youth, a scanty atrophic type of hair, prone to dryness and easy end-splitting. relationship of the pituitary therapy to this patient's hair growth and its change in texture, the author began to study the effects of certain pituitary preparations in cases of alopecia. He reports in sixteen patients, in all of whom the results were so striking that a preliminary report seemed desirable to render this treatment available for investigation by others, in spite of the relatively small number of cases. seems that coincidence could be ruled out by the uni-

form success in these sixteen patients, most of whom tried (one over a period of twenty-three years) various kinds of other treatments. The patients were taken in order of admittance and treated without preference or selection. The results secured might be anticipated on theoretical consideration. An endocrine motor mechanism for the growth of hair must a priori be postulated, and, in view of the intimate association of the sex glands to the development of hair and of the pituitary to the sex glands, this mechanism might reasonably be looked for among these glands. On the basis of his observations the author concludes that a definite therapeutic relationship seems established between certain alopecias and the pituitary gland preparations used. The anterior lobe was in most of the cases, the sole influence in producing the growths of hair obtained. The hypodermic use of pituitary gland secured more satisfactory and more rapid growth than oral administration, which on the whole is disappointing. The combination of hypodermic injections in large doses (2 c.c.) and oral administration was found to give the most rapid response. - J. Am. M. Ass., 1931, 97:

Men and Books

AUGUSTUS BOZZI GRANVILLE— JOURNEYMAN PHYSICIAN*

Dec. 1931]

By W. B. Howell, M.D.,

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If there is one axiom firmly fixed in the minds of modern doctors, it is that to succeed in medicine one must keep one's nose to the grindstone. The application must be begun as a medical student and maintained with unremitting firmness until success is achieved. In the past, when there was less to learn and competition was not so keen, it was possible to lift one's head and look about from time to time without sacrificing one's prospects in life. At the dawn of the nineteenth century a young doctor could do very well without striving after wide clinical experience. Of the three sciences which go to the making of sound medical practice, anatomy, physiology and pathology, the two last named were in their infancy. Physical examination still played a small part in diagnosis, and treatment was dictated by tradition. A blind faith in drugs had been handed down through the centuries.

One of the last survivors of these good old days died in England in 1872 at the age of eighty-nine. His name was Augustus Bozzi Granville. In his old age he wrote an autobiography, which, though it is without any great literary merit, is worth reading because of the light it throws upon medical practice at the beginning of the nineteenth century. He was born before the outbreak of the French Revolution; in the day of the post-chaise, the minuet and the three-cornered hat. He died after the Franco-Prussian War; in the day of the steam railway, the electric telegraph, the waltz and the unromantic bowler. His life-time bridged the gap between John Hunter and Joseph Lister, both of whom reached the zenith of their fame while he was alive.

Granville was born in Milan of a noble Italian family, the Bozzi. At the age of twenty-three, however, he took the name of his maternal grandmother, who had been an Englishwoman. He had a sound classical education. At the age of twelve Livy and Tacitus were his favourite authors. He learned not only to read Latin with pleasure, but to speak it with ease.

with pleasure, but to speak it with ease.

In his boyhood the French were doing their best with fire and sword to spread the doctrine of liberty, equality and fraternity among their neighbours. The north of Italy was the ring in which France was fighting Austria. Lombardy was over-run by the French armies; and

at the age of thirteen Bozzi saw the ragged veterans of the battle of Lodi entering Milan. He describes their leader as "an undersized man, with a lank sallow face . . . with sparkling eyes, overshadowed by straight black hair, which, descending over a large forehead, came down the sides of the head and touched the shoulders." This was General Bonaparte. Men with names little known then, but afterwards famous, were pointed out to the eager school boy: Massena, Lannes, Victor, Berthier, Augereau, and a young aide-de-camp, who had been a waiter and was later to become a king, Joachim Murat. Josephine was in Milan too, at this time; she was often to be seen walking with Napoleon in the public gardens. As a result of the influence of the French invaders, Granville became infected with republican ideas and took part in patriotic demonstrations at the schools. He continued to express his opinions freely after the withdrawal of the French army and at the age of sixteen was arrested by the Austro-Milanese police and thrown into gaol as a political prisoner. However, the influence of his family was strong enough to enable him to go free again after a short incarceration.

Granville went to Pavia for his medical education. Spallanzani, the discoverer of the digestive action of saliva, was one of his teachers. Another was Scarpa, the anatomist and surgeon, a man for whom Granville had a profound admiration. He heard Volta lecture on the voltaic pile, and saw Galvani repeat his experiment on the frog's leg. After taking his degree, Granville returned to Milan and occupied himself for some time in general reading, giving up, however, two hours a day to attendance at one of the hospitals. At this time, the French were back in Lombardy and were forcing Italians to serve in their army. It became necessary for Granville to take measures to evade conscription. He therefore went to Genoa, hoping that he would not be molested under the Genoese flag.

His fine tenor voice, his guitar, and his charming manners soon procured him agreeable companionship, and life went very well with him until the French authorities, who were paramount at Genoa, began to take an interest in him again, and he had to leave hurriedly. Having no passport he joined a touring theatrical company, as "secondo amoroso", and drove across the Apennines with them to Piacenza. There they all embarked in a barge, in which they floated down the river Po, leading a very pleasant happy-go-lucky existence. When at last they reached Venice, and it was time for Granville to appear on the stage, he refused to do so. This led to his being arrested by the Austrian police. However, he regained his liberty by making a cash payment to the manager of the company.

*An address read before the Montreal Medico-Chirurgical Society, May 15th, 1931.

After some time spent in mixing in Venetian society he became restless, and, having obtained a little money from his family and many excellent introductions, he started forth to see something of the world. He found his way from place to place along the eastern shore of the Adriatic in small trading vessels, arriving in the course of time at the Ionian Islands. Whenever he found polite society he stayed for a while. He was able to earn a certain amount of money by desultory practice. At times he was called in consultation by local practitioners, though what help they could have got from him with his scanty experience it is hard to imagine. At Corfu he met William Richard Hamilton, the man to whom England owes the recovery of the Elgin marbles after the wreck of the ship in which they were being sent to England. Hamilton at this time was secretary to the British Embassy at Constantinople. He offered Granville the post of physician to the embassy and the offer was gladly accepted. The two men landed on the Albanian coast and set off on horse-back for Constantinople. When they arrived at Janina Granville was sent for by the governor, Ali Pasha. He must have obeyed the summons with a certain amount of trepidation, for he had heard strange tales about Ali's career of cruelty and fraud. However, the ruffian who had murdered his own mother and brother, only wanted advice about his health and that of his little daughter. So pleased was the Pasha with the result of the consultation that he offered him a handsome salary to stay as his private physician. Granville pleaded his engagement with Lord Elgin and hurried on his way, apprehensive that Ali might detain him by force. His apprehensions were not without some justification for he had not gone far when a mounted messenger caught up with his party and ordered him to return. It was only the authority of Hamilton, speaking in the name of the British ambassador, that relieved Granville of the necessity of returning.

At Athens he fell ill with a severe attack of malaria. He was treated with cinchona, quinine not having been isolated. During his convalescence he noted a prevalence of cervical adenitis among the Athenians of the upper class, and learned that it was ordinarily treated by the application of a plaster containing litharge. This treatment was found to be "very efficacious in producing suppuration". Later in life, when he was practising in London, he used the ointment to obtain this satisfactory result and recommended it to his colleagues.

When he landed at Constantinople he was still very weak from the effects of his malaria, and had to be carried to the embassy. That night he woke with a severe headache and a violent shivering fit. This was the commencement of an attack of plague, which was then epidemic in Constantinople. After his recovery, instead of going back to the embassy, he took the position of private physician in the house of a rich Greek

merchant who needed some one to look after the health of his beautiful daughter. Granville, not being the hero of a novel, did not fall in love with her. Six months later he applied for, and obtained a position in the medical service of the Turkish navy. He was appointed to the vice-admiral's flagship, the crew of which included a large number of galley slaves and condemned prisoners. In due time the squadron sailed. It was composed of six ships of the line, two frigates, and a corvette. Their errand was not one of glory, but to collect taxes from the Greek Islands and coasts tributary to Turkey. There was no difficulty in collecting the taxes; in fact the money was brought on board at each stopping place with precipitate haste, in order to give the admiral no excuse for staying. He was a bad-tempered man; dishonest cashiers and people who were slow in their payments were quick in finding their way to the end of a yard-arm by means of a rope. After some months' service Granville obtained his discharge from the Turkish navy and took a position as supercargo in a polacca sailing from Rhodes for Malaga in Spain. The monotony of the voyage was broken by some Algerian pirates who gave chase, but sheered off when they found that the polacca carried guns.

At Malaga Granville settled down for a while and combined a good deal of social activity with a little medical work and some travelling about the surrounding country. He was in Algeciras on October 21st, 1805, and heard the guns of the Battle of Trafalgar; later, he watched the first prizes being towed into the harbour of Gibraltar. From Malaga he moved to Madrid, where once more be became a popular figure in society. He presented himself before the Real Collegio di Chirurgi, and after passing an examination which was conducted in Latin, obtained a license to practise in any part of Spain. As the medical profession was held in low esteem he made no serious attempt to obtain patients. Nevertheless, the advice of this young foreign doctor was sought by some of the leading physicians of the capital: "all," he says, "very learned men and specially punctilious in the observances of the ceremonies of such consultative meetings." It was while he was at Madrid that he took the name of Granville.

His next move was to Lisbon. The harbour there was at that time full of English and Portugese warships. Ignorant alike of the English and Portugese languages, he applied for an appointment in the Portugese navy, but withdrew his application when he found that he could obtain employment in an English man-of-war. He was appointed acting-assistant-surgeon in H. M. S. Raven. Here again his classical education stood him in good stead, for Latin was the only language in which he could communicate with the surgeon under whom he worked. Within a few weeks of his appointment he was sent to England as one of a prize crew in charge of a captured Danish merchantman.

Soon after his arrival in England he was summoned before a board of medical officers who, after satisfying themselves as to his professional attainments, recommended him for a permanent appointment in the navy. As he spoke only a few words of English the examination was conducted in Latin. Six months later he had learned enough English to appear before the examiners of the Royal College of Surgeons. He passed, and received a warrant as assistant surgeon. At that time naval surgeons were not commissioned officers.

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Granville's service in the navy was not without interest and excitement. He served in a war schooner—the Millbrook, which formed one of a squadron convoying transports to Portugal. Much vigilance was required to frustrate the efforts of privateers which sallied forth from the French coast to attack straggling troopships. Later, the *Millbrook* was stationed off Oporto. One dark night while there, Granville took part in an affair which was intended to be a cutting-out expedition. He was given command of the jolly-boat manned by a crew of six seamen armed with cutlasses and pistols. The enemy ship had disappeared however, so the party, unwilling to go back empty handed, went ashore and stole some sheep for the Millbrook's larder. The schooner came to grief by being caught on a lee shore in a gale. Granville was lying in his bunk when she struck, but upon seeing a piece of rock protruding into the cabin, made his way on deck without any undue loss of time. He succeeded in reaching the shore by clinging to an empty water butt into the bung hole of which he stuffed his hand. In this adventure he lost the outfit of surgical instruments which, according to the custom of the navy at that time, he had been obliged to supply at his own expense. They had cost him forty pounds.

Returning to England he obtained a warrant as full surgeon and was appointed to a ten-gun brig engaged in cruising about the Straits of Dover, on the look-out for French privateers. It was in winter; the brig's operations were carried out during the long and stormy nights; and after three months, Granville, crippled by rheumatism, was invalided ashore. During his convalescence three important events occurred in his life. He was married; he became a member of the Royal College of Surgeons; and he changed his religion from Roman Catholic to Protestant.

In December, 1809, Granville sailed for the West Indies in H. M. S. Arachne, a sloop-of-war. He arrived in Jamaica on New Year's Day, 1810, and on going ashore was not a little impressed by the sight of thousands of land crabs feasting on the half-buried remains of victims of the yellow fever epidemic which was then raging. Next day he was attacked by the disease. He had foreseen that this might happen to him and had coached his sick-bay attendant in the proper treatment. He took a powder consisting of ten grains of jalap, five grains of calomel and five grains of James' powder. Although the

temperature was 90° in his cabin he remained wrapped up in blankets for forty-eight hours. At frequent intervals he had cold water poured upon his head. "The effect of this treatment," he says, "was prodigious." He must have been wrong for he recovered. When his illness was at its worst he overheard the captain and first lieutenant discussing the question of the disposal of his remains when he died. Granville had enough strength to call out that he was not dead, and had no intention of dying.

During the two years he was stationed in the West Indies Granville visited all the principal islands. Not the least remarkable of the places he saw was Port-au-Prince in San Domingo. There, in gorgeous salons, with a retinue of grandees, a negro emperor maintained a court which he fondly believed to be modelled on that of Napoleon. In one particular, his choice of titles, he had outdone Napoleon. The officers of the Arachne had the honour to be presented to the Duc de la Marmelade, and the Duc de

Limonade.

Granville's spare time in the West Indies was by no means wasted. He occupied himself in making meteorological observations, and in studying plant and insect life. He had many opportunities to observe the ravages of the jigger and the guineaworm. While serving in H. M. S. Gloire, to which he had been transferred, he made the acquaintance of Simon Bolivar, "El Liberador," the man who freed South America from Spanish rule. Soon after meeting him, Granville was invalided home on account of "a constitutional tendency to attacks of blood to the head," and was entrusted with Bolivar's despatches to the British government. These he delivered personally into the hands of Robert Peel, then under-secretary for war and the colonies. A few weeks on half-pay in England gave Granville an opportunity to visit Manchester, where he made friends with John Dalton, the chemist, the originator of the atomic theory. During this period he published some critical essays on Kemble's acting of Shakespeare; a feat which speaks well for his quickness in mastering the English language.

In January, 1812, when England was at war with France, and on the verge of war with the United States, Granville reported for duty on board a brand new frigate, the *Maidstone*. The captain had not been at sea for twenty years. Officers and crew had only just joined. Everything was in a state of the utmost confusion when anchor was weighed and the ship began to tack down channel. With the night came fog. A strange ship suddenly appeared alongside—so close that the watch could see through her open gun ports into the brightly lighted "'tween decks." It was impossible to establish It was impossible to establish the stranger's nationality, because the key of the box in which the private signals were kept, could not be found. The boatswain piped the crew to quarters, but none of the seamen knew his post or which was his gun. However, a parley through speaking tubes revealed the fact that the strange ship was the U.S. frigate Constitution,

conveying despatches to England.

One of Granville's fellow officers in the Maidstone was William Edward Parry, who afterwards made a name for himself as an Arctic explorer. The Parry Islands, north of Canada, in the Arctic Ocean, are called after him. The Maidstone left England with orders to proceed across the Atlantic and cruise off the United States coast. On receipt of fresh orders, however, her course was changed and before long she was anchored in the bay at Cadiz, where her crew had an opportunity to watch the bombardment of the town by the French. A week later the Maidstone anchored at Port Mahan in While there Granville was sent for to attend the ill-starred Dowager Duchess of Orleans, widow of the infamous Philippe Egalité. Later, transferred to the line-of-battle ship Swiftsure, he spent six weary months with a squadron engaged in blockading the port of Toulon. The most unpleasant part of his duty was attending floggings at which, often for some trivial offence, a sailor would receive from three to four dozen lashes. There were occasions when he had to get into the boat in which the culprit, condemned by court martial, was rowed through the fleet and flogged alongside each ship. Finally, Granville was sent back to England to act as a witness in the court martial of a lieutenant who had shot a fellow officer in a duel. The quarrel had arisen over a dispute about a dog.

Tired of life at sea, Granville now left the navy. The next five years were occupied in various ways; his friend Hamilton engaged him as a private tutor for his sons; he acted as interpreter to the Foreign Office, translating documents written in Portugese, Spanish, Italian and Greek; he studied anatomy under Joshua Brookes, and surgery under Anthony Carlisle; he even lived for three months in the latter's house as his private pupil. Carlisle was surgeon to the Westminster Hospital and was afterwards knighted. He had certain eccentricities which his enemies put down to affectation; he would, for instance, appear in public with both his gaiters on one leg, or without his waistcoat. Upon one occasion Granville coming down to breakfast, found under his table napkin a small bottle labelled "black dose." "It is the seventh day of the moon," Carlisle explained, "on which everybody who desires to enjoy health, and live long, should give a good scouring to his ali-mentary canal."

During these years Granville went much into society and met many of the most eminent politicians, writers and scientists of the day. He frequented the house of Sir Joseph Banks, who in his youth had accompanied Captain Cook around the world in the Endeavour. Henry Brougham, Dr. Thomas Young, Herschel the astronomer, Dr. Mathew Baillie, physician to St. George's Hospital, Sir Astley Cooper, surgeon to Guy's Hospital, and Everard Home, brother-

in-law of William and John Hunter, were some of the men with whom he came into contact. Upon one occasion, Lord Castlereagh, at that time Foreign Secretary, employed him to carry despatches to Italy. On his way home Granville stopped at Geneva to visit Sir Humphry Davy, at whose house he met Mme. de Stael and young Michael Faraday. At Paris, on the same return journey, he was introduced to Dupuytren, surgeon to the Hôtel Dieu, and Baron de Hum-

boldt, the explorer and naturalist.

About this time Granville made up his mind to "court the upper ten thousand." Perhaps it was as a result of this prudent resolution that he obtained the friendship of Sir Walter Farquhar, the Prince Regent's physician. Farquhar advised Granville to go to Paris and qualify himself to become a specialist in midwifery. He took the advice and spent two years of hard work in Paris. His studies were by no means confined to obstetrics; he dissected; he studied physiology under Magendie; he attended lectures in botany, zoology, comparative anatomy, mineralogy, natural science, chemistry, toxicology and

astronomy.

Laennec was then the principal physician to the Hôpital Necker. In a book, "Sudden Death," which Granville published in 1829, he gave the following account of the invention of the stethoscope. "One day (it was the 13th of September, 1816, for I took a note of it) Laennec seemed dissatisfied with the result of his percussion and direct auscultation in an interesting but obscure case before him; when turning around to the circle of pupils around the bed, 'Why', said he, 'should we not avail ourselves of the help which acoustics yield to us, of making distant sounds more audible?' . . . and forthwith snatching the carte des visites from the hand of the nearest élève interne, and rolling it up lengthwise to the shape of a cylinder, having a perforation through its axis, he applied it first to one side of the chest, then to the other, and again to the back, between and below the shoulder blades, and declared (what we all know to be true) that he could make out with greater distinctness than with the naked ear applied over the parts their inward condition from their respective sounds which he described. . the following day Laennec had procured proper cylinders made of thick pasteboard (for which he not long afterwards substituted hard wood) eight inches long and one and a half inches in diameter, perfectly smooth with an even perforation in its centre." Granville took one of the new instruments back with him to England. When he showed it to his colleagues they laughed at it and at him.

Philippe Pinel was at that time one of the physicians to the Salpétrière. Granville used to visit the hospital from time to time. Upon one occasion he undertook to show an important member of the House of Lords over it. They were making their way through a crowd of patients when a young woman planted herself in

their way, and much to Granville's embarrassment said to his companion, who was a very large and imposing figure, "Dis donc, Père Eternel, m'as tu apporte enfin le permis de mon

mariage"?

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On his return to London Granville took a house in Savile Row. Soon afterwards he presented himself for examination before the Royal College of Physicians and became a licentiate. Beattie, who had been the surgeon in the Victory at Trafalgar, was examined at the same time. Another candidate was a man named Armstrong, who had an enormous practice. He was rejected because of his ignorance of physiology and anatomy. One of the examiners speaking to Granville afterwards of Armstrong's ignorance said, "At last I thought of one of the simplest possible questions that should give him a chance to come off well, so I asked 'Dic mihi, domine, ubi locatum est hepar?" 'In corpore, domine', was the immediate reply." About this time Granville was elected a Fellow of the Royal Society in recognition of his contributions to scientific journals.

In the early years of the nineteenth century it was still the custom for a London physician to dress in a distinctive way. The public expected him, like the clergyman, to wear clothes which were expressive of the gravity of his profession, and to be dignified, if not austere, in his deportment. Granville wore "a square-cut coat of black cloth, a single-breasted black cloth waistcoat, descending low, showing the well-starched frill of an irreproachable white shirt, smalls, with knee buckles, black silk stockings and buckles on shining narrow pumps." "I did not," he says, "adopt the gold-headed cane as well, but wore powder and a broad

brimmed hat."

In spite of his assiduity in paying court to the upper ten thousand, Granville lacked the influence necessary to get an appointment on the staff of one of the large hospitals. He managed, however, in a fiercely contested election, to win the position of physician-accoucheur to the Westminster General Dispensary, an institution which provided medical attendance to poor lying-in women in their homes. In 1827, Granville applied for the position of professor of obstetrical medicine at University College Hos-When the council of the University met to make the appointment, Henry Brougham, the chairman, did not produce Granville's application and testimonials, though he was in possession of them. The only testimonials considered were those of a Dr. Davis who was Mrs. Brougham's medical attendant, and he received the appoint-Theodore Hook was at this time editor of a scandalous journal called John Bull and in its pages he exposed the unfair treatment which Granville had received. Granville's practice, which soon became considerable, was not limited to obstetrics. He called himself a consulting physician. Most of his patients belonged to the aristocracy. One of the earliest was Lady

Melbourne, whose son afterwards became Prime Minister. Granville was called in to see her without the knowledge of her other physicians, and found her dying of an "unchecked inflammation of the spleen." Mrs. Siddons, the actress, was another of his first patients. At the end of the season most of Granville's patients left London; many of them going by his advice, to Kissingen in Bavaria, to drink the waters. By spending his own summers there he was able to make his holidays pay for themselves. On various occasions he went to the continent to attend rich patients or to accompany them when they were travelling. In the summer of 1819 he went to Italy with Lady Ellenborough, the widow of the great lawyer who had defended Warren Hastings at his trial. Among the party was a Miss Towry who had recently been suffering from "an exudation of a troublesome nature behind the ears" and had been cured by a quack doctor. During a stop at Brussels some of the younger members of the party went to a ball. While dancing, this Miss Towry fainted and was brought back to the hotel unconscious. "Finding no pulse at the wrist," Granville says, "I applied my ear to the left side of the chest as I had seen Laennec do at the Hôpital Necker in Paris, but I could hear no indication of any movement." There was a post-mortem, as the patient had been a ward in chancery, and death was found to have been due to a rupture of the left auricle of the heart. In Granville's opinion the quack who had treated her was responsible for her death, having too quickly stopped the discharge from behind the ears.

After escorting his distinguished patient to Florence he proceeded, leisurely enough, on his way back to England. At Paris, however, his return journey changed suddenly into a headlong race for London. The British ambassador had need of a fast messenger to carry despatches to Lord Castlereagh, then Foreign Secretary. It was important that the news contained in them should reach London before the French government could communicate with their ambassador there. Granville galloped out of Paris at night in a calèche with four horses. At Abbeville he heard that the French messenger was ahead of him. At Calais he found that the packet boat was delayed by order of the French government. Undaunted by the gale which was blowing, he hired a fishing boat with a crew of four. Huddled under the half-deck, and covered with a tarpaulin to protect him from rain and spray, he reached Dover without too great loss of time. There, while the horses were being harnessed to his post-chaise, he was told that the French messenger was already on the road to London. By hard riding Granville's postillions succeeded in racing past him on the road. At an inn further on he found four horses waiting in readiness for the French messenger. Helping himself to them he had the satisfaction of delivering the despatches at Lord Castlereagh's house in St. James's Square in the small hours of the morning,

and later, as he was going home, of witnessing the arrival of the belated Frenchman.

The life of the obstetrician is not an easy one even in these days; before the time of railways and motor cars it must have been a good deal harder. One winter night, just after he had finished his dinner, there came an energetic ringing at Granville's door bell. A post-boy had arrived with a letter imploring him to go at once to Salisbury in consultation; the Countess of Pembroke, wife of the Lord-Lieutenant of Wiltshire, was dangerously ill in child-bed. The post-boy had taken nine hours to cover the ninety miles between Salisbury and London. Considering that the road was covered with deep snow the time must have been short enough. Granville hastily provided himself with warm clothing and within half an hour was on his way in a post-chaise. He arrived an hour before daybreak to find all the leading doctors of the neighbourhood assembled in the Lord-Lieutenant's drawing-room with a number of books on midwifery, lying open on an ottoman in the middle of the room. The child had been born, but the mother was slowly bleeding to death. Not even the use of ice and vinegar had been effectual in stopping the hæmorrhage. Granville was ushered into the patient's room, unaccompanied by any of the other doctors. A glance was sufficient to show him the gravity of her condition. With admirable presence of mind he at once ordered a servant to get ready in the adjoining room, a bottle of brandy, a bottle of sherry and some iced vinegar. He then seated himself beside the bed. "The next moment," he says, "the cause of the mischief was revealed. and soon I had done all that was necessary, and a twin child lay in the apron of the astonished nurse. I now proceeded to use the iced vinegar, adding some alum to the solution, until, at the end of half an hour I had the satisfaction of knowing that the application was successful and, further, of finding that the hæmorrhage had entirely ceased." Granville now mixed the wine and brandy in equal parts and administered it in small quantities at a time. Although much of it was vomited, Granville persisted until he obtained the results he was looking for-"a resuscitation of the pulse at the wrist and a degree of exaltation in the head amounting almost to inebriety.'

This case greatly enhanced Granville's reputation as a skilful accoucheur. Shortly after his return to London he received an invitation to dine at the house of Count Simon Worransow, the Russian ambassador, and the father of the lady whose life he had saved. In sitting down at the dinner table Granville found a cheque for £150 under his plate.

This was not the only result of his success at Salisbury. He was invited to accompany the son and daughter-in-law of Count Worransow to Russia, an invitation which he readily accepted. All his expenses were paid and he was given a fee of £1000. The Russian nobleman and

his suite must have formed an imposing procession, for he took with him a staff of cooks and scullions. Granville visited Moscow and St. Petersburg, mixed in the most exclusive society, and saw a number of wealthy patients in consultation. His return journey was made under the most luxurious conditions. His sleigh was drawn by six horses. It was built for travelling by night as well as by day; that is to say, that there was room for him to lie down in it. Wrapped in a complete set of Russian sables, the gift of one of his St. Petersburg patients, with his travelling lamp, his pocket edition of Horace, and an adequate supply of sherry and brandy, his evenings passed pleasantly enough. He went through Warsaw where he was entertained by the Grand Duke Constantine. At Halle he met Johann Friedrich Meckel, the anatomist, and at Weimar no less a person than Goethe.

In 1819 Granville introduced into England the use of prussic acid as a medicine. He published an essay recommending it, especially in the treatment of whooping cough. He had first heard of the use of laurel water when he was in Venice in 1802.

Granville was one of the first men in England to perform the operation of ovariotomy. In 1836 he removed an eight pound ovarian cyst. As he does not say anything in his autobiography about the result one may assume that the patient died. The operation was performed, of course, without an anæsthetic. Speaking of the use of chloroform in surgical operations, he says, "while it annuls pain in the patient it imparts courage to an almost undesirable degree of hardihood in the operator."

In Granville's early years in London the Royal College of Physicians looked with contempt upon the subject of obstetrics. Neither the Royal College of Surgeons nor the Society of Apothecaries examined candidates in it. It was largely through Granville that the subject was forced upon them, by means of legislation which made it an essential part of a medical man's education. His efforts were strenuously opposed by Sir Henry Halford, president of the Royal College of Physicians, who wrote to Mr. Peel, the Home Secretary, saying that midwifery was "unworthy of the notice of gentlemen of academic education."

In 1832, there was an epidemic of cholera in England. Granville was called to see Lord Palmerston who was suddenly taken ill when leaving Downing Street. When Granville arrived he found "the face deadly pale, and shrunken, the eyelids closed: both knees drawn up almost to an acute angle with the surface of the abdomen . . . the whole surface of the body was icy, as was the tongue in a remarkable degree." The patient was stripped and placed in a prone position. "A long band of thick flannel, four inches wide, was spread over and along the spine from the joint in the back of the neck down to the upper portion of the sacrum, the band being held by

the housekeeper at the upper, and by the valet at the lower end." "Over this," he says, "I passed lightly up and down a heated flat iron, such as is used in laundries." This treatment was followed by the application of an "ample cataplasm to the abdomen, after which every vestige of spasmodic contraction or indication of pain or pressure had disappeared!" It was never known by the public that Palmerston had had cholera. He was supposed to have had influenza.

Between the years 1833 and 1848, Granville had a good deal to do with the Bonaparte family. He met Joseph, Lucien and Jerome, Napoleon's brothers, and Prince Lucien Murat, son of the dethroned King of Naples. King Joseph Bonaparte was one of his patients. In July, 1840, Louis Napoleon, afterwards Napoleon Third, promised Joseph that he would do no more plotting to establish himself in France. Within two weeks he landed at Boulogne and after a short conflict with the authorities, was captured and sentenced to life imprisonment in a fortress. It fell to Granville to break the unwelcome news to King Joseph, who on being told became greatly excited. Granville had him hurried off to bed and ordered ice water to be applied to the back of his head, "for," he says, "it is the cerebellum, not the brain, which in such cases is in danger." Joseph awoke next morning, talking coherently, but pronouncing his words with difficulty. "There was not a moment to lose; we were approaching a fresh stroke of apoplexy. I directed him to be cupped forthwith. The rescue from threatening symptoms was almost immediate.'

Granville's autobiography fills two quite large volumes. The incidents which I have selected to retail in this short sketch of his life have seemed to me the most interesting. There are many others to which I should have liked to refer, but for fear of taking up too much of your time, I have refrained. He died in the year 1872, having had the unusual experience of achieving success in his profession after practising it in no less than ten different countries.

MERCURIC CHLORIDE POISONING WITH RECOVERY BY USE OF SODIUM THIOSULPHATE.—A woman, aged 21, took ten 7½ grain tablets (75 grains = 5 grm.) of mercuric chloride with suicidal intent. About 20 minutes after swallowing them, she vomited. She was treated about 10 minutes later by 10 c.c. intravenous injections of sodium thiosulphate every eight hours until five doses had been administered. Her diet was chiefly egg albumin in orange juice, milk and butter milk. It is remarkable that the poison was retained for 20 minutes before she vomited at all, and 30 minutes before an emetic was administered. Six months after taking the poison the patient had normal kidney function and had no symptoms traceable to the mercury.—H. E. Marchbanks, H. Smith and H. L. Church, J. Am. M. Ass., 1931, p. 611.

Association Rotes

ON TO ENGLAND

Members attention! The trip extraordinary! Once in a century! A medico-social pilgrimage

unique in Canadian history!

We might continue the above exclamations with justifiable propriety but such is not necessary. We desire particularly to arrest the attention of those of our readers who may have the intention or the desire to attend the great medical congress in London next summer, it being the occasion of the Centenary Meeting of the British Medical Association. Your special Committee charged with the responsibility of arranging the trip to the Motherland has much pleasure in presenting herewith fairly complete details of the itinerary:—

Saturday, July 2: Sail from Montreal, Saturday morning, on the S.S. Duchess of Atholl. A thousand miles down the placid waters of the St. Lawrence, then the open sea for only four days before landing at Belfast.

Friday, July 8: Due to arrive at Belfast, the capital of Northern Ireland. Seated amid an amphitheatre of lofty hills, and built on a lough whose beautiful shores converge on it, it is little wonder that Belfast has grown with such extraordinary rapidity. Its industries rank among the biggest in the world—linen, shipbuilding, tobacco, rope works and mineral waters being the chief ones. From its beautiful public park—Bellevue Gardens—a wonderful view of Belfast Lough is obtained. Quite close is the Cave Hill, so well known to students of Irish history.

In the afternoon, clinics are being arranged for visiting doctors, 2.00 to 4.00 p.m.

Saturday, July 9: Motor coaches will call for the group on this morning, and the party will proceed via Lisburn, Hillsborough, Dromore, Bunbridge, Newry to Dundalk, where lunch will be served. The afternoon trip continues via Castlebellingham, Monasterboice (where a short stop is made to view the old Celtic Crosses and Round Tower), Drogheda and Balbriggan, arriving at Dublin about three or four o'clock.

Sunday, July 10: In DUBLIN.

Monday, July 11: The Capital of the Irish Free State is full of interest for the visitor. Here will be found a city of delightful contrasts, its old-time houses and public buildings standing side by side with the most modern hotels and mammoth stores. Ever since the days of the Vikings the city has played an eventful rôle in Ireland's struggle for indepen-

dence. Sightseeing in Dublin by motor with guide, visiting Trinity College, which was founded by Queen Elizabeth, the Bank of Ireland, City Hall, Dublin Castle, St. Patrick's Cathedral, St. Stephen's Green, Leinster House, National Museum and the large and beautiful Phoenix Park.

Clinics are being arranged for visiting doctors on July 11th, 10.00 to 12.00 a.m.

Leave Dublin the evening of July 11th by night steamer for Glasgow.

Tuesday, July 12: Due to arrive at GLASGOW, the commercial capital of Scotland, where the River Clyde boasts the largest ship-building yards in the world. Continue by rail, coach, and steamer through the Trossachs, via Loch Lomond, Loch Katrine, and Stirling, to Edinburgh, arriving there in the early evening.

Wednesday, July 13: In EDINBURGH.

Thursday, July 14: The romantic story of the capital runs like a silver thread through Scottish history for well nigh a thousand years. Favoured of the Gods, like Carthage of old, placed amid fertile country, overlooked by Arthur's Seat, within sight of the winding shores of the Firth of Forth, on a commanding site which rivals that of Athens, entrusted with the historic traditions of a nation's greatness, Edinburgh belongs in a peculiar sense to the Scottish race, whose long and ancient story it illuminates, whose birthright it nobly strives to preserve.

Clinics are being arranged for visiting doctors from 10.00 to 12.00 a.m. each day.

Sightseeing in Edinburgh by motor with guide, visiting the world-famous Princess Street and Gardens, the Castle, "Mons Meg" (a cannon built in 1435), St. Margaret's Chapel, the ancient Palace and Parliament Hall, John Knox's House, White Horse Close, Queen Mary's Bath, etc.

In the afternoon of July 14th, the party will motor, via Coldstream, a pleasant little town on the Scottish side of the Tweed, and Wooler to Newcastle.

Friday, July 15: At Newcastle-on-Tyne.

Long ago Newcastle became a busy and expanding industrial town. Coal, iron-working, the making of heavy guns and armour plate, and more important than all, the building of battleships, largely occupy the energies of Tyneside.

Clinics are being arranged for visiting doctors, 10.00 to 12.00 a.m.

Saturday, July 16: On this morning, the motor route continues via Durham, of peculiar strength and great scenic beauty, with the grandest Norman Cathedral in England; Keswick, of the lead pencil industry; through the Lake District whose grandeur is enhanced by

the rich wooded valleys and soft green straths that nestle at their feet, and the myriad colours of the vegetation—even scenes of savage wildness are not lacking; via Grasmere (Wordsworth's House), noted for its quiet beauty; and Ambleside, a very prosperous modernized town, where the route approaches Windermere, the largest of the Lakes. Thence, via Ripon, with the fine early English Cathedral and Fountains Abbey (the most beautiful ruined abbey in England) to Harrogate.

Sunday, July 17: At HARROGATE.

One of the oldest and favourite among fashionable English health resorts. It is a bracing spa, with pump rooms, baths, concerts, palatial buildings and many other interesting features.

No clinics, but conducted parties, at times suitable to hosts, to inspect hydrotherapeutic establishments.

Monday, July 18: The motor route continues via York, famous for its Minster and historical buildings; Leeds, with its thirteenth century eastle; and Huddersfield, an industrial centre, to Manchester.

Tuesday, July 19: In Manchester.

Here remain relics of an olden time which are curious survivals of days when Manchester was a city of modest size. The 15th century Cathedral, the modern John Rylands Library, and the Town Hall will prove of interest.

Clinics are being arranged for visiting doctors, 10.00 to 12.00 a.m.

Wednesday, July 20: Motor to Chester, unique with its incomparable "Rows" (streets of ancient houses with shops on two levels reached by picturesque galleries), making this city entirely charming. The route continues via Wrexham, with a church containing the tomb of Elihu Yale; Shrewsbury, a picturesque old country town; Hereford, with its Normannaved cathedral, to Cardiff.

Thursday, July 21: At CARDIFF.

The foremost city and greatest seaport on the South Wales Coast. The public buildings form one of the finest groups of modern architecture in the Kingdom.

Clinics are being arranged for visiting doctors, 10.00 to 12.00 a.m.

Friday, July 22: Motor via Newport, a modern commercial seaport with an ancient history; Gloucester, with a splendid Normannaved cathedral, to Oxford, the most beautiful university city in the world. Here are the famous Colleges — Christ Church, Magdalen, Brasenose, St. John, Balliol and New College. All Europe offers no more picturesque bit of

street scenery. Thence, via the Thames to London, arriving about 5.30 in the afternoon. (HOTEL VICTORIA AND METROPOLE).

Saturday, July 23 to Friday, July 29: In LONDON.

Sombre, majestic, with the rising Parliament buildings, London Tower, Westminster Abbey, Buckingham Palace and Horse Guards . . . the world's largest city presents an aspect befitting the centre of the vast British Empire.

Centenary Meeting of the British Medical Association.

Saturday, July 30: Leave London by special boat-train and sail from Liverpool on Canadian Pacific S.S. Duchess of York.

Saturday, August 6: Due to arrive at Montreal.

Now as to cost—a most important consideration—may we say that, in the opinion of your Committee, the following information is both gratifying and cheering. Because the movement is being handled by our own Association, we are privileged to quote rates which are exceedingly low for what is offered. Here they are:—

1. Tour as per itinerary, terminating upon arrival in London, with round-trip ocean passage, tourist class, on "Duchesses."

\$380.00

- With minimum rate ocean passage, cabinclass, round trip. . . . \$490.00
- 3. Tour, as per itinerary, including breakfast and room with private bath in London, and round trip ocean-passage, tourist class, \$430.00 With minimum rate ocean-passage, cabinclass, round trip, \$540.00
- 4. Ocean passage only, round trip, tourist class, on "Duchesses", for sailings as per itinerary, \$202.00
- 5. Ocean passage only, round trip, cabinclass, on "Duchesses", for sailings as per itinerary, \$312.00

Special rail rates to and from Montreal are being arranged and will be announced in a booklet being prepared for distribution to our membership.

Members desiring to prolong their stay after the London Congress, may return by any "Duchess" sailing from Liverpool, cabin or tourist class, and also by *Empress of France*

and Empress of Australia, tourist class. After August 1st westbound rates are slightly higher.

Passengers returning by S.S.S. Montrose, Montcalm or Montclare from British ports, occupying minimum cabin class accommodation, will be entitled to a refund of \$19.00.

Members embarking westbound at continental ports, that is, Hamburg, Antwerp, Havre or Cherbourg, will require to pay small additional supplements, in tourist class only. If travelling from these ports, cabin class, on "Mont" ships, there will be a refund, varying according to the port used.

Conditions.

The inclusive price of the tour as outlined will cover the following services:—

1. Motor coach transportation, where specified;

First class channel steamer.

Third-class rail: Glasgow to Edinburgh (via Trossachs); London to Liverpool.

- 2. Accommodations at hotels specified, providing three meals per day, except in London, where breakfast only is provided.
- 3. Meals en route.
- 4. Sightseeing arrangements and excursions as outlined, providing conveyance by motor coach, guide lecturers, and entrance fees to monuments and public buildings.
- 5. Taxes as charged by the hotels in addition to the regular rates.
- 6. Transfer of passengers and hand baggage between ports, railway stations and hotels.
- 7. Services of courier throughout.

Not Included Are.-

Tips on shipboard, meals not specified above, extra beverages, laundry, transportation of excess baggage, passport and visæ fees and other items of similar personal nature.

Hotels to be Used.—

Belfast - - - Hotel Grand Central

Dublin - - - Royal Hibernian Glasgow - - North British Edinburgh - North British

Newcastle - - Central Station Harrogate - Crown or Prospect

Manchester - Midland

Cardiff - - - Name to be supplied London - - Metropole or Victoria

What to do if You are Interested .-

If you have definitely decided to go-

If your wife has decided the matter for you-

If you think you would like to go-

If there is the slightest possibility that you might go—

If you want more particulars-

Please write to the General Secretary at 184 College Street, Toronto, and do it soon, in order that we may proceed without undue haste to assist you with your plans.

In Conclusion

Please remember that this trip is being organized and conducted by the Canadian Medical Association which accounts for the very low cost. While it is a medical party your family and your lay friends are very welcome to come along. Perhaps no more attractive opportunity to visit the Motherland will ever present itself to the medical profession of Canada.

You may make tentative reservations now without cost or obligation. May we hear from you SOON?

Address all communications to-

Dr. T. C. Routley, General Secretary, Canadian Medical Association, 184 College Street, Toronto.

Bospital Service Department Motes

THE AMERICAN HOSPITAL ASSOCIATION MEETING IN TORONTO

The biggest hospital convention ever held in Canada took place in Toronto during the week of September 28th, when the American Hospital Association brought together a group of between four and five thousand hospital workers from all over the continent. Meeting with this body were a number of other allied associations, among which were the Ontario Hospital Association, the American Protestant Hospital Association, the Canadian Hospital Council, the American Occupational Therapy Association, the Children's Hospital Association, the American Association of Hospital Social Workers, the Lænnec Society, and other organizations.

A meeting of this kind is always an inspiration. Old friends meet again; new friendships are formed; suggestions and ideas pour in tumultuously; one finds that others are facing one's very own problems—and solving them too; building committees spend days among the stalls of the vast "million dollar" commercial exhibit (there were over 550 exhibits this year); papers by outstanding hospital and medical leaders draw large crowds; and one returns to the daily grind full of enthusiasm and courage for another year.

One was particularly impressed by the note of optimism everywhere. In his Presidential

address, Dr. Lewis A. Sexton, of Hartford, said "No catastrophe has ever visited a country or a community that did not leave it better than it found it. . . . Can anyone question that we will all be better administrators for having gone through this test of poverty and depleted incomes? Not for a second!" Even the exhibitors declared that they had been unusually successful.

The program was an excellent one. Naturally economies in operation and cheaper service to the public were featured in the program, but the main object of broadening the service of the hospital to the public was never overlooked. The problems of the small hospital, of the teaching hospital, of the dietitian, of the social service worker, of the trustees and of the nurses were discussed. Unfortunately, with three, four or more sessions going on simultaneously, it was impossible to hear all of the excellent programs. A special feature this year was a series of motion pictures, some with sound, on various hospital subjects which was arranged by Dr. M. T. MacEachern. A general session which attracted considerable attention was a symposium on "Health Insurance and its possible Effect upon the Hospitals''. An unusually large number of Canadian speakers participated in the various programs.

As usual, the Round Table Discussions packed the rooms. At one morning session, the questions requested from the floor dealt almost entirely with the problems incident to medical staff relationships. The discussions waxed long and eloquent over the controlling of the medical work and obtaining the cooperation of the doctors. "How can some staff members be made to feel that the hospital has a right to consideration in financial matters?" How can professionally dishonest members be removed from the medical staff? What should be the minimum training for a surgeon before attempting major surgery? As expressed before in these notes, it is most regrettable that the staff members themselves are seldom present to participate in these discussions, for it is at these and similar hospital conventions that the hospital policies of the continent are really deterimned. By actual show of hands, out of that great keenly interested gathering of slightly over one thousand hospital workers, there were but six practising physicians! It is little wonder that comments and opinions concerning the attitude of the medical profession are formed which are quite erroneous.

That evening which will be long remembered was that of the Annual Banquet at which the Right Honourable R. B. Bennett gave an eloquent address before fourteen hundred guests in the Royal York banquet hall. A feature was the presence of the Mendelssohn Choir of two hundred voices, whose thrilling rendition of the

national anthems of the two countries represented will not soon be forgotten by our visitors. The golf trophy for which delegates will compete in the future was presented this year by the Ontario Hospital Association. It is particularly pleasing to the Canadian members of this Association that the unanimous choice for President-Elect was Dr. George F. Stephens, of Winnipeg, the genial medical superintendent of the Winnipeg General Hospital, whose executive ability will make him a most happy choice for this coveted honour.

AIR TRAFFIC AND INFECTIOUS DISEASES

While the advance of civilization and growth of science are, on the one hand, an aid to medical knowledge, on the other, they increase the problems with which it has to deal. To-day public health authorities are faced with the danger of infection from air-borne passengers, and since it is likely that transportation of this kind will increase, the importance of preventive measures against air-transported diseases is worthy of wider recognition.

It is easy to visualize the possible dangers of infection from air-borne traffic as against seaborne when it is realized that by greater speed the whole world is more closely united together. For instance, a passenger infected with cholera or yellow fever, plague, or typhus, or smallpox, may be incubating the disease on his journey and show no visible signs of it until he arrives at his home. In such a case medical inspection at an air port would be useless. It may be argued that yellow fever, cholera or typhoid may be spread by other means than air passengers, but it should be remembered that their position is unique on account of the time

Diseases are probably brought into a country by air traffic in two ways; primarily, by passengers or crew; secondly, by mosquitoes, rats and other vermin in the machine or cargo.

The Office Internationale d'Hygiène Publique have drawn attention to the importance of drafting regulations for air traffic as regards Sanitary Defence. They suggest that attention should be paid to: (a) established aerodromes; (b) the examination of passengers on arrival; (c) the sanitary "surveillance" of persons from infected areas; and (d) in special cases, and where necessary, the strict isolation of passengers and machine during port calls.

This aspect of public health calls for imagination and study, and in relation to it the United States Immigration laws will be found more comprehensive than those of most other countries.—The Hospital (London).

AUTOPSIES IN HOSPITALS

There is considerable truth in the statement that "the scientific atmosphere of a hospital is in direct ratio to the percentage of its autopsies." Without doubt very few hospitals ever rise above mediocrity until the medical staff begins to question its ante-mortem diagnoses and develops a consuming curiosity in post-mortem revelations. The great contributions of pioneer pathologists in certain continental centres were made possible in large part by the ease with which these investigators were able to broaden their pathological experience. Without doubt the world's fund of pathological knowledge would be greater to-day had some of the regulations of Austria and Germany for instance, concerning postmortem examination been universally adopted. Fortunately, the public is gradually becoming more cognizant of the value of post-mortem examinations; doctors are now not so reluctant to request an autopsy, especially those doctors who have served an interneship in a good hospital, and, as a result, the percentage of post-mortem examinations obtained is gradually rising.

What are the best reasons to advance when approaching a relative of the deceased? What is the best procedure to follow in instructing one's internes on this subject? An interesting review of these arguments and methods of especial value to the interne was contributed to a recent issue of the Bulletin of the Chicago Hospital Association by W. G. Hibbs, M.D., the pathologist of the Children's Memorial

Hospital.

It is extremely important that the doctor be absolutely convinced of the value as well as of the honesty of his request, for a post-mortem examination is not an experiment; it is a sincere attempt to learn the truth, and this should be emphasized in negotiating with the relatives. In fact, relatives who at first seem bitterly opposed will themselves request one when the case is properly presented. mission should be requested in every case unless the doctor in charge objects. An "entente cordiale" with the members of the family should be established. The interne should be courteous at all times to the relatives, and, in the probability of death, should invite them to telephone him personally and frequently as to the patient's condition. Request permission immediately after death but be sure that the family knows that the patient is dead before seeking permission for the autopsy. Get the family away from the bedside, and talk to them or to the responsible relative in a quiet room free from confusion. A close relative, when most keenly affected and grieved by the death of one most near and dear, is at that moment more willing to consent than at any other time.

If consent is deferred until after a family conference, usually held in the absence of the interne or doctor, the telephoned reply is usually in the negative, largely because of the poor representation of the doctor's arguments. Autopsy permit blanks should be immediately available and should be signed by the proper individual.

Arguments vary with each case. The one appeal that has had most success is that based on the good which may at some time accrue to someone else, for death seems to awaken a sudden out-pouring of unselfishness. Moreover, the examination may discover the presence of inheritable disease and be helpful in saving the lives of others in the family. The presentation of the scientific reason, the addition to medical knowledge, is often less successful. Where a life insurance policy is concerned, it may be pointed out to the relatives that it may be impossible to fill in the insurance papers without the knowledge of the exact cause of death. This may apply also to the filling out of the certificate of death itself. The relatives should be assured that the matter is entirely for them to decide and, if no written permission is given, no examination will be made. It should be pointed out that the examination would be done as carefully as would an operation. would be no visible mutilation of the body as prepared for burial. Incidentally, although Doctor Hibbs does not make reference to this point, greater care might be taken in preserving the skin of the throat and breast, especially in women. A high median incision extending up to the suprasternal notch is exceedingly difficult to conceal with the present day low cut clothing, much to the chagrin and annoyance of the undertaker. This could be avoided by the use of a sweeping U-shaped incision over the chest placed sufficiently low and wide that it may be concealed by the dress. This incision connects with the usual longitudinal incision and the flap thus formed can be turned up with the sternum, which can be freed from below.

The cooperation rather than the antagonism of undertakers should be sought. Unnecessary examinations which make embalming impossible should be avoided and a list should be kept of those undertakers who are in sympathy with the desire to increase scientific knowledge. The writer might have added also that the task of the undertaker to embalm an autopsied body could be lightened considerably were more efforts taken to ligate and preserve the more important vessels. A large share of the opposition of the undertaker arises as a result of the increased difficulties which he encounters when the body is turned over to him, and a conference between the local undertakers and those members of the medical staff who perform the autopsies would lead to much better understanding and cooperation.

Medical Societies

NEWFOUNDLAND MEDICAL ASSOCIATION

The Newfoundland Medical Association held its eighth annual Convention at St. John's on August 27th to 29th, and had the privilege of listening to some able addresses by two representatives from the Canadian Medical Association.

Dr. H. P. Wright and Dr. A. L. Wilkie, both from Montreal, included Newfoundland in their Maritime post-graduate tour and were cordially welcomed to the "Ancient Colony".

On Thursday, August 27th, at the afternoon session, Dr. Wright spoke on "Artificial feeding of the normal child," and Dr. Wilkie on "Gallbladder disease."

Friday and Saturday mornings were occupied with bedside clinics at the General and Grace Hospitals. On Friday afternoon Dr. Wilkie's address was on "Intestinal obstruction", and Dr. Wright's "Failure to gain in infancy."

The lectures were illustrated by lantern slides and were listened to with great interest. The attendance at the meetings was flattering to the lecturers, and encouraging for the Officers of the Association, being larger than had been anticipated, while all who attended felt that it had been worth while.

At the business meeting on Saturday 29th, the following officers of the Association were elected: President, Dr. Lamont Paterson, St. John's; First Vice-president, Dr. S. E. Kean, Brookfield; Second Vice-president, Dr. W. Roberts, St. John's; Secretary-Treasurer, Dr. John Grieve, St. John's.

N. S. Fraser

THE ACADEMY OF MEDICINE, TORONTO

A special meeting of the Academy of Medicine, Toronto, was held on the evening of October 23rd, when addresses were given by Prof. William Wright, Dean of the London Hospital Medical College, and Prof. George A. Buckmaster, University of Bristol. A dinner was held in the Academy preceding the meeting.

Professor Wright took as the subject of his address "A lecture on anatomy as it would have been given by Andreas Vesalius, 1514-1565." His presentation was quite unique. He devoted some time to creating a suitable atmosphere for his hearers. This was done by black-board drawing with coloured crayons and by giving a sketch of the life of Vesalius. Having transported his audience to the time of the great anatomist, he then delivered the lecture in English as it would have been given by Vesalius himself. His audience was highly delighted.

Professor Buckmaster followed with an address on "The oxidation and action of

adrenalin." He gave an account of a series of experiments that have been conducted in the Department of Physiology at the University of Bristol during the last three or four years. These experiments demonstrated the effect of amino-acids in prolonging the effect of adrenalin. He also showed lantern slides of an experiment to demonstrate the effect of adrenalin on the serous coat of the bowel as contrasted with its effect on the mucous coat.

A vote of thanks was proposed by Prof. C. H. Best and seconded by Dean Primrose.

A special afternoon meeting of the Academy of Medicine, Toronto, on October 26th was addressed by Mr. A. Lawrence Abel, F.R.C.S., of London England. Mr. Abel, in response to our invitation, stopped off in Toronto on his way home from the meeting of the American College of Surgeons, to which he had been specially invited. He gave a lecture on "Cancer of the rectum," based upon his experiences at the Cancer Hospital in London. He demonstrated the technique of the abdomino-perineal operation by means of an excellent cinematograph film. The lecture was much appreciated by the large gathering, and a vote of thanks, proposed by Dr. M. H. V. Cameron, was seconded by Dr. Harold Wookey.

The Academy of Medicine, Toronto, was addressed on November 3rd by Dr. D. B. Phemister, Professor of Surgery, University of Chicago, on the subject "Intracapsular fractures of the neck of the femur." The speaker was introduced by Dr. T. A. J. Duff, Chairman of the Section of Surgery.

Dr. Phemister lectured from a large series of lantern slides, showing x-ray, biopsy and pathological specimens. The chief point stressed was the frequency of collapse of the head of the femur where weight-bearing is initiated too soon. Strong appreciation of the speaker and his address was expressed by Drs. Geo. Wilson, W. E. Gallie, E. S. Ryerson and D. E. Robertson.

THE EDMONTON ACADEMY OF MEDICINE

The November meeting of the Academy was held at the Medical Building on November 4th. A letter from the Honourable Mr. Hoadley, Minister of Health, regarding the treatment of the indigent was discussed and a committee appointed to bring in a report on the matter at the next meeting.

After the nomination of officers for the coming year, Dr. Heber Jamieson resumed his series of ten minute talks on the medical history of western Canada. In a very interesting manner he spoke on "The coming of medicine to southern Alberta."

Dr. Harold Orr presented two well-developed cases of rare skin affections—mycosis fungoides and multiple benign basal-celled epithelioma

(Spiegler's endothelioma)—illustrating his able and concise description of these conditions by microscopic slides projected on a screen. Dr. Vango discussed the pathology of these cases.

The main paper of the meeting was given by Dr. L. C. Conn, Professor of Obstetrics and Gynœcology, Alberta University, who took as his subject "Modern concepts of prenatal care." Referring at the outset to the maternal death rate in Canada, which was considerably higher than that of many European countries, the speaker emphasized the necessity of a much greater degree of prenatal care of the expectant mother by physicians, than the average case gets at present. It should be our aim that medical supervision from the first month throughout pregnancy should become the rule, rather than the exception, as it is at the present time, and, further, that that medical supervision should be of such a thorough nature that the physician will not only guard the patient against any abnormal tendencies during pregnancy, but by physical examination make himself certain that the termination of pregnancy will not be attended by any untoward difficulties, which can be obviated or prepared for in advance in the best interests of the patient.

Dr. Conn's excellent and exhaustive treatment of his subject brought forth an animated discussion and many questions related to the subject, participated in by Doctors Wright, Wilson, Prust, Swallow, Day, Hepburn, Miller, Blezzard, Brander and Weinloss. At the conclusion of the discussion Dr. Viola Rae, a recent graduate of the Pathological Department of the university, discussed the Zondek-Ascheim reaction of the urine in pregnancy.

T. H. WHITELAW

THE MIDDLESEX COUNTY MEDICAL ASSOCIATION

The newly elected officers of the Middlesex County Medical Association are as follows: President, Dr. C. H. McDougall, Strathroy; First Vice-President, Dr. H. C. Fletcher, Arva; Second Vice-President, Dr. H. G. Pink, Delaware; Secretary-Treasurer, Dr. W. H. Woods, Mount Brydges.

THE HALTON COUNTY MEDICAL SOCIETY

A well attended meeting of the Halton County Medical Society was held at Milton on November 4th. Addresses were given by Drs. T. C. Routley, J. H. Holbrook and W. K. Colbeck. Dr. John Urquhart, of Oakville, one of the oldest practising physicians of the county, spoke in a reminiscent mood and gave some interesting comparisons of modern and old-time practice. Dr. Roscoe Graham gave an address on "Abdominal emergencies".

The following officers were elected: Honorary President, Dr. John Urquhart, Oakville; Presi-

dent, Dr. A. McAllister, Georgetown; Vice-President, Dr. H. A. McColl, Milton; Secretary-Treasurer, Dr. C. V. Williams, Georgetown; Executive, Drs. W. M. Wilkinson, Oakville, and W. A. Bodkin, Burlington.

MONTREAL OPHTHALMOLOGICAL SOCIETY

The first meeting of the Montreal Ophthalmological Society for the session, 1931-1932 was held on October 22nd. Dr. George Badeaux, the president, occupied the chair, and the following program was presented.

"Cuénod-Nataf operation for trichiasis," (living case), François Badeaux; "Vaccine infection of the eye," A. Bramley-Moore; "Melanoma of the eyeball and lids," (clinical report and pathological slides), A. G. McAuley; "Persistent hyaloid artery," (living case), F. T. Tooke; "Tranta dots in vernal catarrh," (living case), J. Rosenbaum; "Ocular changes in traumatic asphyxia," Gordon Byers; "Symmetrical posterior polar hæmorrhage," (living case), J. A. MacMillan; "Gouin operation in an aphakic eye," (living case), S. Ramsey; Eclipse blindness from lightning flash," (preliminary report), Ramsey and Alexander.

University Motes

Dalhousie University

Very simple ceremonies marked the formal installation of Mr. Carleton W. Stanley as president of Dalhousie University, on the ninth of October, but the welcome extended to the new president could not have been more cordial. A large representation from other Universities added to the interest of the occasion, which was made colourful by the variety of gowns displayed. In the evening a dinner, tendered by members of the University to the visitors, was held at the Nova Scotian Hotel and proved to be a delightful function.

Mount Allison University

"Dedicated to the search for truth, in the service of God and man," the new science building of Mount Allison University was formally opened on October 21st.

opened on October 21st.

Rev. Dr. G. J. Trueman, president of the university, presided at the ceremony, which was part of the founder's day celebration and attended by students and hundreds of graduates.

Conferring of honorary degrees of doctor of laws on two distinguished scientists, George S. Whitby, M. Sc., Ph. D., A.R.C.S., of the National Research Council of Canada, Ottawa, and Professor J. C. Simpson, B.Sc., secretary of the faculty of medicine, McGill University, provided another feature of the program.

McGill University

Julian C. Smith, LL.D. an honorary graduate of McGill University has presented to the Faculty of Medicine several sets of instruments in use by his grandfather while a practitioner in Massachusetts.

These antique instruments form a very welcome addition to the collection of the Medical Museum and are particularly welcome as an evidence of the interest which some of our graduates and friends are manifesting in the school.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

A committee was recently set up by the university political associations to discuss the present arrangements for rectorial elections. In many European countries the post of Rector is one of great antiquity. In Scotland, while the office of Chancellor of the University is one of great age and dignity that of the Lord Rector is of more recent origin. The Lord Rector is the elected representative on the University Court of the students, who in the exercise of their freedom of choice preserve the democratic character of the mediæval university. Mr. Gladstone was elected, in 1859, the first Lord Rector of Edinburgh University. Since that day many celebrated men have been elected to the post. Such names as Rosebery, Haldane, Stanley Baldwin, Lloyd George, and Winston Churchill show that since the office has been instituted the elections have usually had a political character. This has not always been the case, as Thomas Carlyle, one of the most famous of Lord Rectors, was elected in 1867, while Kitchener and Earl Beatty have also held this position. The general feeling now, is that a radical alteration is required, not only in the basis of election but also in the mode of carrying it through. It is felt that by limiting the choice of candidates to politicians the university is debarred from the benefits which a Lord Rector eminent in some other sphere might bring. In addition, political candidates have seldom time to devote to their duties to the university. In Edinburgh in 1929 only a small number of students—45 per cent -recorded their votes in what was a threecornered contest. This is certainly suggestive of a lack of interest on the part of the undergraduate electorate. It may be that the various political organizations in the university will agree to abandon the rectorial contest upon a political basis. In this they would be following the lead of the students of St. Andrew's University, who in recent years have chosen as Lord Rectors such interesting personalities as J. M. Barrie, Rudyard Kipling and Fridtjof

During September two notable Edinburgh medical anniversaries occurred.

Mungo Park was born on the River Yarrow in Selkirkshire on September 10, 1771, and perished at Bussa on the Niger in 1806. He, along with James Bruce, who discovered the source of the Blue Nile, and David Livingstone, form a trio of notable Scotsmen who helped to unlock the doors guarding the Dark Con-Park attended the University of Edinburgh (1789-1791) and obtained the surgical diploma. In his two expeditions to Africa, he traced the waters of the Niger for more than a thousand miles, but died before solving the problem of its outflow into the Bight of Benin.

John Brown was born on September 22, 1810, at Biggar in Lanarkshire, and it is scarcely fifty years since he died. He graduated M.D. at Edinburgh University in 1833 and practised as a physician in the city. He is best known for his two volumes of essays, "Horæ Subsecivæ", "Rab and his Friends" and "Marjorie Fleming". The first volume of "Horæ Subsecive" deals chiefly with the equipment and duties of a physician. John Brown won the admiration of such widely differing men as Ruskin, Thackeray and R. L. Stevenson, while Swinburn wrote a sonnet in honour of him. When Gladstone was elected Lord Rector of Edinburgh University, he appointed John Brown to the post of Lord Rector's Assessor.

At the invitation of the Medical Council of the League of Nations, Dr. Alexander Shearer, Administrative Medical Officer of the Highlands and Islands Medical Service for Scotland, attended a conference at Geneva in July. The object of the Conference was to consider appropriate methods of securing efficient medical and ancillary services, in those parts of Europe where it is known that such would be of benefit, owing to there being no such arrangements at the present time. The Highlands and Islands Medical Service has served as a pattern for similar schemes in Kentucky, South Africa and Newfoundland, and there is no doubt that a similar system will be introduced sooner or later into the more backward parts of Europe.

The opening of the winter session in Edinburgh will see three new medical professors installed. Prof. James Couper Brash, of the Birmingham University, has been appointed to the Chair of Anatomy in place of Professor Robinson. In Pathology, Dr. A. Murray Drennan succeeds the late Prof. Lorrain Smith, while Dr. Charles McNeil has been appointed to the newly founded Edward Clark Chair of Child Life and Health. In Glasgow, Prof. John Glaister, for close on half a century Lecturer

and Regius Professor of Forensic Medicine, has resigned. He has been followed in the chair by his son, John Glaister, a student and undergraduate of Glasgow University. The father for many years has been prominent in the academic and public life of Glasgow. He is the author of the well-known text-book. His son, who is 39 years of age, has been Professor of Forensic Medicine in the University of Cairo and medico-legal adviser to the Egyptian Government for the last two years.

In view of the general situation, the Royal College of Physicians has decided to postpone for the present the celebration of the 250th Anniversary of the foundation of the College.

The Edinburgh Royal Infirmary extension appeal fund now amounts to over £214,000. Included in this is the sum of £2,924, representing the proceeds from the command performance of "The Admirable Crichton" at the Lyceum Theatre, at which the King and Queen were present. Among other sums subscribed is £328/10/0 from the Old Residents' Club of

the Edinburgh Royal Infirmary.

A Blood-Transfusion Service has been formed in Edinburgh for persons willing to offer blood for transfusion in urgent cases. During the nine months that have elapsed since the service was instituted, it is estimated that the lives of about two dozen persons have been saved. The service, which is a purely voluntary one, has a list of graded donors. Those who offer themselves are tested and if this is satisfactory are graded according to the category of their blood. The service is at the disposal of the medical profession. Applicants are supplied with a donor when one is required. One donor on the list of the Blood-Transfusion Service in Edinburgh has given 3½ pints in seven weeks, but, as a rule, donors who have given a pint of blood are not asked to give another until two months after the first transfusion. The service, which is now being utilized more frequently, has recently received five calls in one week-end.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

Each year on St. Luke's Day the College of Physicians of London meets to hear the orator for the year pay tribute to Harvey. This year Dr. Robert Hutchison delivered a very striking address which will well repay close study in its extensive form in the weekly medical journals. He showed very clearly that the most modern development of medicine, sometimes irreverently called the "back-to-Hippocrates" movement, descends directly from Harvey's teachings. The enunciation of the humoral doctrines by Hippocrates was clearly foreshadowing biochemistry, while treatment of the sick individual and not of the disease is an important plank in the platform of the neo-Hippocratic school. Perhaps more important in Dr. Hutchison's remarks were the passages where he left Harvey for the moment and discoursed on the modern position in medicine. He pleaded for more hypotheses and less facts, for more poetry in science and for more vision. Personality in science, he insisted, is more nceessary than is usually realized and there is also great scope for more unity between workers in the ever widening field of medical science. Those who heard Dr. Hutchison speak in Canada last year know his very personal style of quiet incisiveness and he was in very good form at the College last month.

The subject of voluntary euthanasia is not in many ways a pleasant one, but neither is a visit to a home for incurables, and, in delivering his presidential address on this topic before the Society of Medical Officers of Health, Dr. C. Killick Millard has performed a useful task. He proposes that individuals, who have attained to years of discretion, and who are suffering from an incurable and fatal disease which usually entails a slow and painful death, should be allowed by law—if they so desire, and if they have complied with the requisite conditions—to substitute for the slow and painful death a quick and painless one. Dr. Millard discussed the fundamental objections to such a proceeding, closely connected with the whole problem of suicide, and he developed the thesis that far from being an object of censure the act of legalized voluntary euthanasia would be regarded as rational, courageous and often highly altruistic. He quoted a draft bill which he had devised to meet modern conditions, and the practical difficulties which might occur he met with very plausible arguments, even describing the most satisfactory procedure for performance of the act itself. It debatable whether civilization has yet reached the stage of development when it can tolerate decisions on the matter of death by individuals, but Dr. Millard has at any rate succeeded in stating the case for voluntary euthanasia, and as a pioneer he will hardly expect to find all his remarks taken too seriously.

When the hospital out-patient physician orders a nourishing diet for some of the patients under his care he knows very well that under existing conditions of life in London he might as well order them to go to the sunny south of France for the winter. A very valuable work, therefore, is being done by those organizations which exist to supply food to the sick poor, and the establishment of "Invalid

Kitchens" in several of the poorest and worst housed districts of London is a great help. Here well-cooked and nourishing food is supplied to invalids, convalescent patients, maternity cases, and to patients awaiting admission to hospitals and sanatoria. A local secretary investigates every case referred to the kitchen by some health or welfare organization and assesses the patient to pay 1d. to 4d. per day for his dinners, according to circumstances. A medical certificate is necessary and after this dinners may be continued for as long as five weeks. At one typical centre an average of 100 dinners a day in winter and 30 in summer were supplied to a total of nearly 500 patients in one year and towards the cost of this only about one-fifth was accounted for by patients' payments and special finds. This type of auxiliary help to medicine is a valuable part of our fight against disease, and as it is only too often carried on without any publicity, this opportunity of making it known to a wider audience is welcomed.

ALAN MONCRIEFF

London, November, 1931.

The New Zealand Letter

(From our own correspondent)

MEDICAL RESEARCH IN NEW ZEALAND

A country the size of Great Britain which has been settled less than a century and which has a million or so of inhabitants has enough to do to establish and maintain the amenities commonly demanded by Europeans without deeply concerning itself with research, however much this may be required. Research on the grand scale is not to be looked for, and the bulk of what has been done is the work of individuals, with a few notable exceptions. The Cawthron Institute at Nelson conducts research in agriculture and fruit-growing, with special reference to insect and other pests and their extermination. It has also completed a soil survey of the Nelson District and can advise intending settlers as to the possibilities of land in any part of it. The Massey College at Palmerston North is concerned with pastoral problems; Lincoln College, in Canterbury, similarly studies grain, more especially wheat. The Government also conducts industrial and other research in various directions. The New Zealand Institute publishes independent work read before the Otago and other local Institutes, makes a few money grants for research, and awards certain memorial medals. Much of the work on botany, palæontology and other subjects has been of a high order, and has occasionally led to the Fellowship of the Royal Society.

What is true of the conditions of research in general is true of medical research in particular;

most of it has been done by university professors in such time as they could spare from routine teaching, and with neither the funds nor the personnel available to provide much assistance. A considerable amount has, however, been achieved and the principal items are here briefly reviewed.

It is frequently stated that the infant mortality in New Zealand is the lowest in the world and the credit for this is generally attributed to the Plunket Society, although it was the fact long before that body came into existence. Society came into being through the activities of Sir Truby King. This gentleman, a New Zealander, and Ettles Scholar of his year at Edinburgh, entered the Mental Hospitals Service and in time became Superintendent of the Seacliff Mental Hospital in Otago, where he had charge of a considerable farm. He became interested in the livestock, at first in poultry, later in calves, pigs and potatoes, all of which he very considerably improved. He either began with or arrived at certain principles which showed him to be a good deal in advance of his time, namely, that the diet of young animals should approximate as nearly as possible to that provided by Nature and also that abundant fresh air and sunshine are of the first importance for both animals and plants, and scrupulous bodily cleanliness for the former. In 1905, he became interested in babies, and proceeded to apply the same principles to their rearing, at the same time keeping well abreast of the English and American work on the subject as regards scientific infant feeding, clean milk, municipal depots and the like. His aim was to maintain natural conditions, with an obvious insistance on breast-feeding and the impetus he gave to this is perhaps his greatest contribution to infant welfare. His principles further led him to demand for the babies sunlight, fresh air, cleanliness, separate cradles, regularity of feeding, and when breast-feeding ended, pasteurization of milk, clean bottles, the abolition of tubes to them, and a modification of cow's milk which should approximate as nearly as possible to human milk. This latter had to be developed on a commercial scale. It has been many times altered, and, in consequence of the constantly changing views on the proper content of infants' food, must always remain the most controversial part of his work. The women of the country soon became interested, for which the late Mrs., afterwards Lady, King, was largely responsible, and a Society was formed which was named the Plunket Society, after the Governor of the period; this receives a large subsidy from the Government. It established the "Plunket Nurses," who are fully trained and certified women who have also undergone a specialist training for six months at the Karitane Hospital in Dunedin, after which they go all over the country and conduct dispensaries, acting as district nurses for young children. Dr. King was unable to obtain beds for treatment at the Dunedin Hospital, so he started treatment

at Karitane, near Seacliff, where he lived, and the Karitane Hospitals, now established in all the centres, are named accordingly. The head-quarters remains in Dunedin, and all education takes place there. Besides the "Plunket Nurses" they train also the "Karitane Nurses" who enter as untrained girls for a year's course, after which they become qualified to undertake charge of a normal infant. About 1920 Sir Truby King was made Director of Child Welfare, thus establishing liaison between the Government and the

Plunket Society.

In anatomy, the late John Halliday Scott, Professor of Anatomy and Physiology for many years, made an exhaustive study of the Maori skeleton, and collected much valuable material now in the Anatomical Museum. A great deal of work has been done under the present professor, Dr. W. P. Gowland, on the brain of tuatara, a New Zealand lizard, Sphenodon punctatum, a survival of a very early type. In 1926 John Cairney published a general survey of the forebrain in the Journal of Comparative Anatomy, Archibald Durward studied the Cell-masses in the Fore-brain and J. C. R. Hindenach the Cerebellum. (Papers in the Journal of Anatomy, 1930 and 1931.) Spermatogenesis of Sphenodon, and also the reptilian stomach, with special reference to the same animal, are now being studied in the Department. Durward has also worked on the fore-brain of a native bird, the kiwi, Apteryx australis. A good deal of work has been completed on the human circulatory system, including an M.D. Thesis by R. L. Flett on the "Musculature of the Heart with its Application to Physiology, and a note on Heart Rupture." (Journal of Anatomy, 1928.), several studies on arteries by Cairney, and others on veins by Cairney and by E. V. Maxwell and G. S. Erwin (*ibid.*, 1924-1928), development being largely considered in them; and there is work in progress on bones, secondary os calcis, duplication of the internal cuneiform, and on brachyphalangy in New Zealand, by various students.

Dr. John Malcolm was appointed to the Chair of Physiology in 1906, and some work has been issued by his department almost every year since that time. He began with the study of the physiological effects of the extracts and active principles of native plants, especially tu tu (with Dr. Frank Fitchett), and later went on independently to the study of the toxicity of the seeds and of the juice of the berry. The plant grows much like bracken, it contains highly poisonous glucosides, and was very destructive to stock in the early settlements. Other New Zealand plants were also studied, but this really pharmacological work was found considerably to strain the resources of a physiological department, and attention was turned (1912) to food values of native products, kumara (sweet potato) and others, and a series of papers was published (1920-29) on the food values of New Zealand fish and on the biochemistry of mutton-bird oil. In 1927, a Government Department of Scientific and Industrial Research was established, and in its interest the food-value experiments were extended to food stuffs for stock, and in Malcolm's laboratory work has been done on meat, on the vitamin content of butter, on cheese, and on the influence of churning on the vitamin distribution in cream and butter. Dr. Helen Easterfield, when holding a Lady King Scholarship, investigated the fat-content of the milk of nursing women at different times of day, and demonstrated that the maximum amount was present in the forenoon.

New Zealand is fortunate in having few endemic diseases. The most prevalent, and one which catches the eye of the visiting doctor in every street, is goitre; and being a pastoral country a considerable number of cases of hydatid disease occur.

An extensive research on goitre has been in progress for some years. At the first meeting of the New Zealand Medical Society in 1880 its prevalence among his attendants and patients was described by Dr. Hacon, then Superintendent of the Christchurch Mental Hospital, and its distribution was studies by the first Professor of Medicine, Dr. Daniel Colquhoun. Dr. Murray Drennan, when appointed to the Chair of Pathology, recognized the likeness of the condition to that prevalent in the Great Lakes District in America, and advised the assay of food stuffs for iodine. Independently, in 1920, the Professor of Bacteriology and Public Health, Dr. C. E. Hercus, who was then in the Health Department Medical Service, studied the incidence in school children in Christchurch and had a survey conducted throughout the Dominion, when remarkable local variations in incidence were demonstrated. A low incidence at Lyttelton, a few miles from Christchurch, where it is very high, and the discovery that the Lyttelton water supply was contaminated with sea water and contained a little iodine, led Hercus ultimately to an investigation of iodine in soils and the demonstration of an inverse ratio between the soil iodine and the incidence of goitre in school children in the districts examined. This was followed by an assay of the iodine content of the food raised on the various soils, which gave confirmatory results. (Journal of Hygiene, 1925-Since then other problems, cognate, have been studied, among them the value of iodized salt in prophylaxis. A "Goitre Clinic" is in being at Dunedin Hospital, and for some years the clinical and pathological aspects of simple and toxic goitre have undergone intensive study, and the results should shortly be published.

Hydatid disease has also been studied. A complement fixation test was worked out by Hercus, independently of Fairley in Australia but at the same time, and the epidemiology, with special reference to dogs, and the parasitology have also been investigated. New Zealand surgeons are familiar with hydatid cases, and Sir Louis Barnett has published a good deal on the subject, and many papers have been written on its radio-

logical and clinical aspects, most of which are collected in the *Proceedings of the University of Otago Medical School*, 1921-31.

Research on hay-fever has been conducted under Hercus for five years. Field surveys with dates of pollenation have been carried out, and a determination of the relative importance of the different pollens. Antigenic studies are also in progress.

Dr. Noel Fulton made a statistical investigation of the incidence and varieties of cancer in New Zealand in 1926. In 1929, Mr. Sampson Handley attended the Annual Medical Congress in New Zealand as representative of the British Medical Association and he strongly urged the formation of a local branch of the British Empire Cancer Campaign. This was accordingly done. A public subscription was opened, and Cancer Clinics were established in all the centres, which are now in being. At Dunedin, at the Medical School, a Research Laboratory was put under the charge of Dr. A. M. Begg who had had a large experience of cancer research in London. Dr. Begg, who has associated with him Mr. H. A. A. Aitken as chemist, has issued two progress reports of his work. The first included the establishment of standard tumours for investigation, and immunological, biochemical and physical studies, and some experiments in therapy The second report in the laboratory animals. describes the progress in all these together with work on carcinogenetic agents. Laboratory work on cancer notoriously lacks rapid or dramatic results.

As is proper, the principal medical research in New Zealand is directed towards the specific and unsolved problems peculiar to the country, and it is comparatively rarely that experiments can be conducted which are of universal application. However, so far as opportunity offers, efforts are made in that direction.

D. W. CARMALT JONES.

University of Otago, Dunedin, N.Z.

Cop-Liver Oil in Powder Form.—G. Mansfeld and Z. Horn (Deut. med. Woch., August 21, 1931, p. 1452) have tested a powdered form of cod-liver oil (jemalt) for both its growth-promoting and anti-rachitic effects. The powder contains 30 per cent of dried cod-liver oil, and is said to have a pleasant taste. The growth experiments were carried out on young white rats kept in the dark on a rachitogenic diet. The rickets experiments were designed to test the therapeutic and prophylactic effects of the preparation, and were controlled chemically, radiologically, and histologically. The authors conclude that this powdered preparation of cod-liver oil retains its activity as far as vitamins A and D are concerned.—Abs., Brit. M. J.

Letters, Potes and Queries William Dunlop

[Dr. Harvey Smith sends the following note relating to Col. Ford's article on William Dunlop, which appeared in our August issue. It will be of interest to our readers.—Ed.] To the Editor:

Dunlop was an overseer in the Huron tract, under my wife's grandfather John Galt, and I have long been interested in him. The writer refers to the story of how his brother Robert got his wife. As I understand it they tossed for her, the understanding being that if the coin came down heads Robert Dunlop would marry her, if tails, the "Tiger." The latter had a coin with heads on both sides. The following quotations give the incident in fuller detail.

"Small as the community was, simple as were the ways of that primitive society, Mrs. Grundy had arrived, and it was demanded that the Highland lassie should be let go. The Doctor gravely told his brother that there was but one way out of the difficulty, viz., for one of them to marry her; he was willing to decide which of them it should be, by three tosses of a penny—he to provide the coin. Three tosses were solemnly given with a double headed penny, and the unsuspecting Captain became a candidate for matrimony."—Extracted from "In the days of the Canada Company," by the Misses Lizars.

"The Doctor, and his brother the Captain, both old bachelors, lived on their estate of Galbraith, near Goderich, with a respectable Scotch-body, as the Doctor called her, for their house-keeper. Now whether any scandal had been raised, or whether the Doctor thought it would conduce to their greater comfort, if he or his brother were to marry the house-keeper, or whether he meant it only for a joke to tease his brother, does not appear. Be that as it may, the Doctor proposed, in consequence, he said, of some unpleasant remarks, and their lonely situation, for one of them to marry her.

"'Now Sandy, you know I would almost as soon hang myself as put my head into the matrimonial noose, yet I think it only fair to stand my chance. So, what I propose is, that each of us shall toss up a copper* three times, and he who has the most heads shall be free.'

"As this appeared a very fair proposition the Captain at once consented to the arrangement, and they immediately proceeded to bring this friendly contest for a wife to an issue.

"The doctor would not have consented to run the risk of losing his liberty, if he had not been perfectly sure of winning, for by some chance he had become possessed of a halfpenny with a head on either side. So when they came to toss up, as might be expected, the poor

unconscious Captain was elected for matrimonial honours, to the great glee of the roguish Doctor, who, I make no doubt, chuckled over his successful strategem."—Extracted from, "Twenty-seven years in Canada West," by Strickland.

Strange as it may appear, the Captain honourably fulfilled this singular agreement. I have understood that the lady filled her new station with great credit and propriety, and I have heard, at the death of the two brothers, inherited all their property.

Although the winner of Mrs. Dunlop had some reason to rejoice in getting a good wife so easily, yet I would advise all gentlemen before trying their chance in such a lottery, to examine whether their opponent is the fortunate possessor of a coin with two heads.

Another amusing incident may be related.

"One hot sultry July evening, the celebrated Dr. Dunlop called to have a chat with the bishop (Macdonald), who knowing the Doctor's weak point, his fondness for strong drinks, and his almost rabid antipathy to water, asked him if he would take a draught of Edinburgh ale, as he had just received a cask in a present from the old country. The doctor's thirst grew to a perfect drought, and he exclaimed 'that nothing at that moment could afford him greater pleasure.'

The bell was rung, the spruce neat servant girl appeared, and was forthwith commissioned to take the bishop's own silver tankard and draw the thirsty doctor a pint of ale. The girl quickly returned, the impatient doctor grasped the nectarian draught, and, without glaneing into the tankard—for the time

'Was that soft hour 'twixt summer's eve and close,'

emptied the greater part of its contents down his throat. A spasmodic contortion and a sudden rush to the open window surprised the hospitable bishop, who anticipated a great treat for his guest. 'My dear sir,' he cried, 'what can be the matter?'

"'Oh that diabolical stuff!' groaned the doctor. 'I am poisoned.' 'Oh, never fear, said the bishop, examining the liquid that still remained in the tankard, and bursting into a hearty laugh. 'It may not agree with a Protestant's stomach, but believe me, dear doctor, you never took such a wholesome drink in your life before. I was lately sent from Rome a cask of holy water; it stands in the same cellar with the ale; I put a little salt into it to preserve it during the hot weather, and the girl, by mistake has given you the consecrated water instead of the ale.'

"'Oh, curse her,' said the doctor, 'I wish it was in her stomach instead of mine!' "—Extracted from Mrs. Moodie's "Life in the Clearing versus the Bush." 1844?

^{*} Canadian term for a halfpenny.

Topics of Current Interest

The Limitations of Science

Professor Sir J. Arthur Thomson, in an address at Hove, said that since both science and religion were natural and necessary expressions of the evolving spirit of man it was in most ways to be regretted that time and temper should be wasted in bringing them into opposition. Both were inherently noble, both made for the enrichment of life, both were rights of way towards truth.

Their conflict, he continued, must be very largely a false antithesis, due to a misunderstanding of their aims and methods. Science aims at making the world—Nature and man—intelligible. Religion in its intellectual aspects seeks to show that the world is reasonable. Science is descriptive, while religion is interpretative. Science never asks why.

Religion on its intellectual side is cognate to philosophy—it is the layman's philosophy. It always implies, when worthy of the name, a transcendental or mystical interpretation, reached when men strain at the limits of their practical, emotional, or intellectual reach. It always implies something spiritual—something beyond ordinary experience.

If religion is to interpret the world and man it is of obvious importance that it should deal with the facts of the case. But science is always giving us a new world—Copernican, Newtonian, Darwinian, Einsteinian, and so forth. Thus it is an unending task of religion to adjust its interpretation to the new world; and it is often hazardous to put new wine into old skins. Modern science has disclosed a world of surpassing grandeur, and while the world becomes more and more intelligible it also becomes more full of wonder and mystery. The Weekly Times, Oct. 1, 1931.

General Smuts on the Nature of the Universe

The centenary meeting of the British Association for the Advancement of Science had a brilliant opening in London last week. There was a record membership, and the Earl of Athlone, formerly Governor-General of South Africa, received General Smuts, the president of the association, when he gave his presidential address at the Central Hall, Westminster. A message from the King to General Smuts from Balmoral Castle was read in which his Majesty said: "Although we live in times fraught with difficulties, scientific progress does not slacken, and I know that the contributions to all branches of science made by your worldrenowned members of the past are continued to-day by many distinguished men.'

General Smuts, in his presidential address, devoted himself to the question, "What sort of a world-picture is science leading to?" He showed that there is much in contemporary physics to surprise and bewilder those who have assumed science to be glorified common sense. The discrete solid elements have been resolved not only into molecules and atoms, but also into a continuous series of systems of electrons and protons, differing only in their numbers, arrangements, and motions. But even these provisionally ultimate particles of matter, the supposed playthings of force, have become transformed into nodes or waves of energy—yet, whether the one or the other, or simultaneously both, merely mathematical formulæ. Nor are they even mathematical formulæ on the classical conception when time and space were taken to be the ordained warp and woof of the universe.

There is no conception more shattering to common sense than the new doctrine that, whether in the stellar macrocosm or in the recesses of what we have known as matter. time has no absolute before and after, space no this way or that way. Each is undirected, and relative to the other; the absolute has gone. None the less it is a rational doctrine, and it has brought into its orbit a wide range of physical observations which hitherto could not be harmonized. But there is still the quantum of Planck, an inference from well-established observations and calculations, which remains obstinately outside of and incongruous with the orderly continuity of the space-time universe, as irrational and positively objective as the elements of last century.

To complete his scientific picture, General Smuts turned from physics to biology. The great truth of organic evolution, he said, had been hammered into the consciousness of mankind. The unity and interconnections of life in all its manifold forms had been clearly recognized. In the process of evolution new structures and organs, and also new functions and powers, have appeared, culminating in the "master-key of mind" and the crowning achievement of human personality. Darwin had completed the revolution begun by Copernicus, and had brought man down from the angels to take his proper place in the order of nature. But, the president insisted, there are momentous differences between the physical and biological pictures.

In the time-space continuum there is no before and after; the process of evolution postulates a beginning and a progress. The physical universe seems on the whole to be running down; biological time shows on the whole a forward movement towards ever higher organization. Organic evolution describes the specific peculiarity of life; and

life, with its spontaneity and creativeness, which fitted ill with the mechanistic theories of last century, still remains a stranger among

the conceptions of the new physics.

General Smuts found some analogies between life and the quantum. The quantum behaves as an indivisible whole; so does life. A part of a quantum is nothing; so also with life. It is a specific configuration, and can exist only as such; so also with life. It does not fall completely within the deterministic scheme; nor does life. The analogy led him to a restatement of the theory to which he has given the name "holism" and as opposed to a mechanical interpretation of life. An organic whole is not the sum of its parts, nor have the parts any individuality of their own. Life is a function of organization, an expression of holism. He read the same principle into the physical world, and claimed that, although perhaps in a lower degree, the principle or category of the whole applied to the atom or electron and to the quantum as much as to living beings. Matter was fundamentally an organization of space-time and life an organization of space-time patterns. Mind was an even more potent embodiment of the organizing, whole-making principle. And life, with its ultimate product, mind, the maker of values, may be the final achievement of a dying universe.—The Weekly Times, Oct. 1, 1931.

The New System of Health Insurance in France

The account of the new system of health insurance in France, and your leading article upon it (Sept. 26th, pp. 707 and 692), must have been of the greatest interest to all panel practitioners in this country. In England panel practice was begun some 20 years ago by bluffing the poorer general practitioners—a not very propitious start. The logical mind of the French is a strong asset, and it is interesting to note that similar tactics have failed with that great nation. The French doctors have shown that placing the moral and material welfare of the patient first they are irresistible to the onslaughts of any political party. They did not employ the threat of a strike, but simply that of a combined front; solidarity of the profession with the threat of non-cooperation with any political party who opposed their just and necessary claims. They refused to have practice divided into two groups, insurance and private. They made (and rightly) their slogan the entente directe, with no lay department intervening between doctor and They insisted moreover that the patient. doctor should first be faced with a patient and then with a fee received from that patient, and

a fee to which the patient had himself to contribute a fraction which was not covered by insurance—a most important moral element. Tribute should be rendered also to the regard of French doctors for the inviolable preservation of the secret professional, and, above all, to their insistence on the control of medical matters and discipline by the medical profession. They further insisted that the medical practitioner must have full charge and control of the patient who has sought his advice, while under treatment. French practitioners are free from the keeping of useless files of record cards. What corresponds to the regional medical officer in France is chiefly concerned in dealing with patients, and not, as in England, in dealing surreptitious raps over the knuckles to panel practitioners.

Insurance practitioners in England are not likely to be slow in reading the lesson to be learnt from France. If the victory of the doctors in France has been too great, the victory of bureaucracy over the doctors has been too great in England. It is certain that punishment for the so-called "crimes" of overprescribing and over-certification will not long be tolerated in England. Surely the Ministry of Health would be wise to offer wide reforms in the terms of service before much more is demanded as a right. The conversion of a great profession into a trade would then cease.

—Dr. J. C. G. Dickinson in The Lancet, 1931, 2:

868.

Medical Education in the United States

This week for the thirty-first consecutive year the Journal publishes statistics regarding medical education in the United States. These include not only the figures on medical education proper but also data regarding premedical education and the interneship. The figures which have been collected show that again the great majority of the freshmen in medical schools came from accredited colleges. Of the 626 freshmen accepted from other institutions, 242, or 38.6 per cent, had obtained baccalaureate or higher degrees, and 46 per cent of the total number of freshmen presented baccalaureate or higher degrees.

One new medical school began instruction in the session of 1930-1931 (Duke University School of Medicine) and two of the schools which formerly offered only the first two years of the medical course will add the clinical years this fall (University of Southern California School of Medicine and University of Missouri School of Medicine). A merger of significance to graduate medical education took place when, in July, the New York Post-Graduate Medical School and Hospital became a part of Columbia University.

An interesting development of the past year in medical education was the enrolment of large numbers of American students in foreign medical schools. The total number reported to have been enrolled in 90 European schools up to the time this issue went to press was 663. There were 277 registered in 8 Canadian That this migration of medical schools. American students is a new development is evident from the small number of students reported to have graduated from foreign schools last year. An explanation may be found in the statistics on medical education published in the last few years, which show that the number of students admitted to the American medical schools each year is becoming more and more a constant figure. A large proportion of the students who go abroad probably are influenced by the difficulties encountered in securing admission to American medical colleges and by the present low cost of transportation and living abroad. Presumably, most of these students expect to return to the United States to practice. In view of the figures published last year, which showed that the United States had the largest relative supply of physicians of any country, there seems no immediate need for a larger number of medical graduates than the American colleges are able to supply.

This year, the reports on interneships were kindly contributed by officials of hospitals approved for interneships. Every one of the 664 hospitals, offering 6,124 interneships, submitted a report. Last year the reports came from former internes. Interest was demonstrated in clinical pathological conferences, the securing of necropsies, medical libraries and dispensary service. The efforts of the Council to place these interneships on a distinctly educational basis have indeed borne fruit.— Edit., J. Am. M. Ass., 1931, 97: 646.

ECTOPIC DECIDUAL TISSUE IN ABSENCE OF PREG-NANCY .- J. Schereschewsky states that nests of decidual cells have been found during pregnancy in the ovaries, oviducts, pelvic peritoneum, omentum, appendix, and pelvic lymph glands, and also in hernial sacs and in polypi of the cervix or corpus uteri. Such ectopic decidual tissue has been reported in the absence of pregnancy by Schiller, and also by Frankl in a patient aged 54. In a case described by Schereschewsky, a woman, aged 32, shortly after abortion was found to have a polypus protruding into the posterior fornix from a node of ectopic endometrioid tissue in the rectovaginal septum. The polypus contained scanty gland tissue in a stroma of decidual cells; its structure was similar three months later, after recurrence. The persistence of the decidual reaction is attributable to hormonic influence from the corpus luteum of menstruation.-Arch. f. Gynäk., 1931, p. 241.

Abstracts from Current Literature MEDICINE

The Anæmias of Infancy and Early Childhood. Parsons, L. G., J. Am. M. Ass., 1931, 97: 973.

Parsons attempts to link together in this paper the findings obtained in experimental hæmatology with the clinical aspects of the subject. The importance of this connection is stressed because unfortunately the practical applications of many research discoveries are lost sight of. The author points out the instability of the hæmatopoietic system in childhood, and concludes that one cannot pay too much attention to minor morphological changes which may be found in the blood at a particular time. Infantile anæmias are therefore classified on an etiological rather than a morphological basis. The four groups into which these anemias fall are "those due to a defect of nutrition, those due to infection, those due to abnormal hæmolysis, and those due to a combination of one or more of the preceding causes."

So far as the simple nutritional anæmias are concerned, the author recalls that they have been recognized for many years as following upon a diet closely restricted to milk. Observation of artificially fed infants has shown that the incidence of anæmias is high shortly after birth and towards the end of the first year. It was supposed in the past that the reason for the development of the anæmias was the lack of iron in the milk. However, Steenbock and his co-workers recently proved that iron and small quantities of copper were essential in the restoration of hæmoglobin in the experimental anæmias of animals. The reason for the maintenance of a normal blood picture in the affected infants following birth has been explained by several authorities on the grounds of the slow utilization of iron and copper stores already present in the body at birth. In justification of this conclusion are analyses of organs of young animals which have shown that after birth the percentage of copper and iron in the organs falls definitely, though slowly. As regards the rôle of organic substances in the production of anæmias, the author collects evidence to show that some of the amino-acids are essential in the synthesis of hæmoglobin. All of the author's cases of simple nutritional anæmia responded to the administration of iron while a well balanced diet was fed. In his own mind Parsons is not certain just how necessary copper is in the treatment of these anæmias.

The subgroup characterized as constitutional nutritional anemias is in some respects similar to the simple nutritional anemias, the most striking differences being the poor response to therapy and the presence of an enlarged spleen in the former group. The disease occurs chiefly in premature infants and in twins. Parsons has been able to produce in rats what he believes to be analogous to constitutional nutritional anæmias in infants. The anæmias due to infection are of course well recognized. The author calls attention to two particular forms, the anæmia which accompanies the syndrome of gastro-intestinal infection, and that which occurs with infections of the urinary tract. The author does not believe that there is any etiological relationship between the hæmolytic processes at birth, and the subsequent development of nutritional anæmias. He would therefore place them in a separate class. Although this paper was written primarily for pædiatricians, it will be of interest to all who are following hæmatological progress.

J. FEIGENBAUM

Early Diagnosis and Early Treatment of Arteriolar (Essential) hypertension. Ayman, D., N. Eng. J. Med., 1931, 9: 424.

The early diagnosis of arteriolar hypertension is hampered because of the fear on the part of the physician of inducing undue anxiety in patients by frequent blood pressure examinations. The second cause of lack of interest in the diagnosis is the absence of specific therapy. Another reason for the failure to recognize hypertension early is the unfounded assumption that the disease occurs almost wholly in middle life, and that it is rare in young persons. Finally, the diagnosis is often overlooked because some physicians do not pay sufficient attention to blood pressure readings only slightly above normal. Ayman accepts the normal standards of Rogers and Hunter for his own work. The average systolic figure of these standards is 120 mm. of mercury for a person of 60 years.

The author has many significant conclusions regarding the clinical manifestations of essential hypertension. One of the most interesting is the fact that variability of blood pressure is perhaps the most constant finding in the physical examination, more constant, indeed, than the elevation in the blood pressure. For as many as 56 per cent of a series of cases of hypertension showed a normal blood pressure after rest. To quote the author "It is thus possible to state paradoxically that one may have a normal blood pressure in essential hypertension". The marked lability of the blood pressure is explained by the exaggerated responses of the arterioles to stimuli which produce contraction and relaxation of these Now the author believes that the symptoms of hypertension are due to a constriction of arterioles. In the early cases, the reduction in the lumen of the vessels is reversible, and is frequently induced by emotional causes. In the later cases it is due to anatomical changes, arteriolar sclerosis, which can be observed in post-mortem examinations. Ayman has become impressed with the constitutional predisposition to hypertension, particularly as it is expressed in the psychological panel. He finds that the majority of his patients are of the "high pressure" type. They work intensely and quickly, are easily elated or depressed, are very sensitive to their surroundings, and are inclined to be quick-tempered. (It will be recalled that Draper in 1924 indicated that cases of hypertension with nephritis showed distinct, definitive, anatomical tendencies.)

The author has some suggestions on treatment of the early cases of hypertension. In the first place, he advises measures which will "modify the personality", an obviously difficult task, as he admits. There are no indications for the limitation of salts, fluids or protein in the diet. As far as drugs are concerned, the sedatives seem to be preferred. There is some question whether the sulphocyanates recently employed in hypertension do not achieve their end by acting as sedatives. Moreover, the psychotherapeutic effects of any drug cannot be discounted entirely, inasmuch as, as already pointed out, the blood pressure under controlled conditions varies a good deal. In general, the author would assign a secondary place to drugs in the treatment of hypertension, at least in our present state of knowledge. J. FEIGENBAUM

Thyrotoxic Circulatory Symptoms with Low Metabolic Rate. Morris R. S., Am. Heart J., 1931, 6: 730.

The author in this article presents four cases to show that the basal metabolic rate, while very helpful when elevated, is a sign which should be ignored when normal or subnormal in presence of unmistakable evidence of thyrotoxic signs and symptoms. It is pointed out that the thyroid heart is the one type of preventable heart disease and that in all patients with cardiac neurosis the possibility of disease of the thyroid should never be lost sight of. All cases presented showed definite signs of thyrotoxic circulatory disturbance. The basal metabolic rates ranged from -32 per cent to +7 per cent. In all cases subtotal thyroidectomy brought about clinical recovery.

W. H. HATFIELD

Epidemic Meningitis Minor. Praithwaite, J. V. C. and Innes, W. M., Brit. M. J., 1931, 2: 567.

Last spring, within less than seven weeks, 13 children presenting a clinical picture resembling that of Quincke's "serous meningitis" were admitted to the Leicester Royal Infirmary. While sporadic cases of the Quincke

type of meningitis are not uncommon, this is the first record of its epidemic prevalence in England. Five of the cases were primary; 8 were secondary to broncho-pneumonia, which was usually mild in character. In all there was nuchal rigidity; Kernig's sign was present in all but two; and there was raised temperature in all but one. When the fontanelle was patent, it bulged. Strabismus was absent, and no papilledema was noted in the fundi examined. No middle ear involvement was determined. In the primary cases, symptoms disappeared quickly after lumbar puncture. In the secondary cases the meningeal signs cleared up after puncture, while the bronchopneumonia ran its usual course. In two cases the meningeal symptoms disappeared without lumbar puncture. One of these cases ended fatally, death being due to broncho-pneumonia. All of the others made a good recovery. All of the patients were under six years of age. Cerebrospinal fluid escaped under increased pressure in the eleven cases in which puncture was performed; it was clear, sterile, and did not form a coagulum on standing. There was usually a slight increase in protein, but otherwise few sera presented any abnormality.

This epidemic synchronized with mild epidemics of cerebrospinal meningitis and influenza, and the authors regard it as being an abortive form of influenzal meningitis. While resembling the serous meningitis of Quincke, its benign course suggests that the name "meningitis minor" is preferable.

W. H. HATTIE

A Filterable Micro-Organism in the Blood of Pernicious Anæmia. Holst, A., Zeit. f. Hyg. u. Infektionskunde, 1931, 112: 646.

Blood is collected in tubes and allowed to coagulate. It is heated to 56° for half-an-hour. The serum is poured off. The clot is shaken with tap-water. A number of samples are pooled and 3 per cent NaCl added to a third of the amount, to enable the material to be centrifuged more readily. It is now filtered through a Poulenc candle ("L7") and tubed in 4 to 5 c.c. quantities.

Blood is collected from cases of pernicious anæmia in the same way and ½ to 1 c.c. of the fluid is inoculated into one of the abovenamed tubes. A control must also be put up. After 4 to 5 days at 37°, the contents are filtered through an L3 candle to get rid of streptococci (e.g.), and ½ to 1 c.c. added to a second stock tube (control also). Subcultures were made every few days for weeks on end. The characteristic hæmoglobin change of pernicious anæmia always developed. Photographs of the spectra are given.

Attempts to convey the disease from these cultures to monkeys have so far failed, but there

seems no doubt there is a specific agent in the cultures. It always passes the L3 filter, and in one case it passed an L7. Perhaps this agent accounts for certain morphological appearances in the red cells.

O. C. GRUNER

The Diphtheria Disaster at Medellin. Brit. M. J., 1931, 1: 760.

This article is written with a view to showing the importance of reporting avoidable errors to the profession.

In October of last year at Medellin, in Colombia, South America, a group of 48 children was inoculated for immunization against diphtheria. All the children showed positive Shick reactions. Injections of 0.5 c.c., 1 c.c., and 1.5 c.c. were given at 17 and 21 day intervals. Following the third inoculation 16 of the children died. Investigation showed that diphtheria toxin had been used for the third inoculation instead of formol-toxoid (Ramon's anatoxin) and it was estimated that each child got about 375 guinea-pig m.l.d.

All the children showed symptoms such as pain at the site of injection, fever, restlessness, and often convulsions during the first few hours. Fourteen died within 60 hours, 1 on the sixth day and 1 in the sixth week. The majority were given anti-diphtheritic serum in varying amounts and at varying intervals, but always after symptoms had developed and the beneficial effect was questioned. Of the 32 children who recovered 26 showed mild symptoms; 3 showed local swelling, ulceration and necrosis; and 3 developed paralysis. The gradation of the effect of the toxin is explained on the basis of individual degrees of immunity produced by the first two immunizing doses.

Ten of the patients developed false membranes in the throat. These membranes were free from diphtheria organisms by smear and culture and were attributed to the effect of the toxin.

Other similar errors are recorded as having occurred at Baden, Concord, Dallas and Bundaberg, except that at the latter the fatality is attributed to contamination of the prophylactic with staphylococci.

The moral pointed out is clear enough—first, the need to examine any material used for injection in the event of unusual symptoms appearing, and next the wisdom of keeping bottles of toxin and toxoid separate.

P. N. MACDERMOT

Three Generations of Inherited Dental Defect. Rutherford, M. E., Brit. M. J., 1931, 2: 9.

Rutherford gives the history of a man, his mother, and his grandmother who had gross abnormalities of the teeth. In each instance

the person was affected with poor vision due to corneal opacities. The grandmother was one of eleven children. She was the only one affected with bad sight. She had no teeth until she was grown, when two erupted under her tongue. Of her four children, only one daughter was affected. She had congenital corneal opacities that left her practically blind. She had no teeth until she was 7 years old, when the two lower central incisors erupted. The gums were so hypertrophied that she could not close her mouth. This deformity was corrected when she was 19. Her son in turn also had corneal opacities, and no teeth until he was past 15. At 23, he had cut 8 teeth, but his gums, like his mother's, were much hypertrophied, and so apparently prevented the appearance of more teeth. defect had been to some extent corrected at 15. The fourth generation of this family was represented by the little son of this man. His face and head were very asymmetrical, the testes were undescended, and there was no scrotal sac.

MADGE THURLOW MACKLIN

Osteogenesis Imperfecta. Gleich, M., N. Y. St. Med. J., 1930, 30: 850.

This record concerns a man and three of his sons who had a tendency to an undue number of fractures. The patients were negroes. The father, aged 45, had fractured his right femur five times. He had six children, of whom the 17 year old girl, and the boy and girl, aged 4 and 2, were normal. The three sons, aged 15, 11 and 9, inherited their father's disease. The first of these boys had broken his leg twelve times; and the other two children had also had an undue number of fractures. Roentgenograms showed that the disease was present in each case.

MADGE THURLOW MACKLIN

Bronchomoniliasis Associated with Cancer of the Lung. Romano, N., and Lorenzo, R., Rev. Méd. Lat.-Amer., 1931, 16: 822.

Cases of bronchomycosis have already been published by Lorenzo, in which moniliasis, penicilliosis and aspergillosis were featured. The present case is furnished by a Jew of 56 years of age, who had suffered from asthma for some years, and now came to hospital because of hæmoptysis. A full clinical report is given and the differential diagnosis from tuberculosis and syphilis and other causes of hæmoptysis (distoma, amœbiasis, etc.) is fully discussed. Radiographs showed patches of consolidation over both lungs. Bacteriological examination and animal inoculation experiments showed an infection by Monilia zeylanica of Castellani, the organisms being isolated from the sputum. Pathogenic subcultures were fatal to rabbits in

7 to 8 days when given intravenously. Intraperitoneal inoculation was negative; subcutaneous inoculation produced an abscess.

The clinical features were progressive emaciation, persistent asthmatiform bronchitis, and constant hæmoptysis. The case was considered of interest because of the progressive tendency to more severe lesions, the obstinacy of the hæmoptysis, the absence of Ciani-membranes in the sputum, and the negligible benefit derived from antigenic therapy. The possibility of a dual disease was considered, as explaining some of the discrepancies in the symptomatology.

A subsequent post-mortem showed the presence of a pulmonary neoplasm, arising in the bronchial epithelium. The possibility of a causal relation between the two conditions is not discussed. It is considered that the neoplasm provides a favourable basis for the spread of the mycosis.

O. C. GRUNER

SURGERY

The Differentiation of Organic and Spastic Vascular Occlusions. de Takats, G., Ann. Surg., 1931, 94: 321.

The same broad division into mechanical and dynamic occlusions that is commonly applied to intestinal obstruction is admirably suited to the classification of the analogous peripheral vascular disorders. Mechanical (organic) occlusions obstruct the lumen with a clot, constrict it through a narrowing of the wall, or compress it from without. Dynamic occlusions are due to either vessel spasm, or paralysis producing stasis in erythromelalgia. This classification is given:

1. Mechanical occlusions:

Acute: traumatic; embolic. Chronic: degenerative arteriosclerotic; inflammatory thrombo-angiitis obliterans.

2. Dynamic occlusions:

Spastic: Raynaud; cervical rib or spina bifida; endocrine disorders. Paralytic erythromelgia.

It is therefore obvious that in all cases except the acute mechanical occlusions, where the etiology must be obvious, it is of paramount importance in treatment to determine whether the occlusion is organic or spastic in origin, or whether an organic occlusion is aggravated by a superimposed spasm. Six diagnostic measures have been offered, of which three can be dismissed in summary fashion, due to obvious disadvantages or dangers. These are: (1) The induction of fever with intravenous typhoid vaccine, and the subsequent determination of the "vasomotor index"; (2) general anæsthesia,

and (3) paravertebral block, with readings of the skin temperature before and after such procedures. (4) The diathermy test has not been fully reported upon. (5) White and Morton advocate the use of spinal anæsthesia, skin-temperature readings being taken with the thermocouple galvanometer. This procedure is open to the objection that the pain tracts are blocked, and thus the effects of future sympathectomy in relation to pain cannot be judged. (6) The choice of the author is peripheral nerve block. The vasomotor fibres to the vessels run in the peripheral nerves, and are given off to the vessels segmentally. A block of the peripheral nerve should thus result in an increase in temperature of the innervated limb, since the vasoconstrictors will be paralyzed. The skin temperature of the big toe on the plantar surface is taken, the posterior tibial nerve blocked, and when complete anæsthesia of the plantar surface of the foot is obtained (ten to fifteen minutes) another temperature reading is taken. ordinary skin thermometer is used. groups of patients are thus separated, corresponding to three identical groups in vascular disease:

Complete vasodilatation follows nerve block. All changes are due to vascular spasm. This is the group with a "normal vasodilatation level", i.e., exceeding 33° C., usually reaching 34° or 35° C. Readings below 33° C. are subtracted from this figure and the difference obtained is the "obstruction index". In this group, there is no obstruction index, and sympathectomy is indicated. (b) No rise of temperature takes place after nerve block. In this class fall old arteriosclerotic and diabetic patients with practically no superimposed spasm. Hence a minimal temperature rise and a high obstruction index, averaging 5° C. (i.e., $33^{\circ}-28^{\circ}-5^{\circ}$). (c) In which there is a certain rise of temperature, but not enough to reach 33°. These are cases of true obstruction with superimposed spasm. Such cases are those of Buerger's disease, or early arteriosclerotic occlusion. The amount of vascular spasm must decide whether sympathectomy offers any improvement or not.

In spastic cases rational treatment must be both medical and surgical, with physical means, drugs, and sympathectomy in selected cases.

IAN G. MACDONALD

Surgical Aspects of Septicæmia. Wilkie, D. P. D., Brit. M. J., 1931, 2: 594.

Fruitful debate upon the treatment of this condition is difficult. Features peculiar to the individual case, irregular incidence of cases, and changing ideas of the value of certain lines of treatment make it almost impossible to estimate any given series with scientific exactitude. "We are so apt to enthrone in the sunshine of our memory the apparently striking success, and to

allow the many failures to slip into the quiet shadows of forgetfulness."

The stage may be set for septicæmia in one of three ways: (1) following an infected accidental wound; (2) accompanying an idiopathic infection, as acute osteomyelitis, cellulitis, phlebitis; (3) following operation on an infected area.

In the first two surgical intervention may be called for, but nicety of judgment is necessary in determining how much must be done, and when. Restraint must be placed upon active measures until the indications for intervention are clear, for the knife may be a lethal weapon if prematurely or incautiously applied. Respect for, and aid to, the natural barriers to infection are essential in the successful treatment of such wounds. In this connection, the value of Bier's passive (venous) congestion is emphasized, especially in the common streptococcal infected wound of finger or hand. A Bier's bandage, rightly applied, relieves pain, and should be worn for twenty-two out of the twenty-four This measure should always precede incision, which is only of service when (a) dangerous tension has arisen, or (b) dead cells have accumulated in the shape of pus. The only exception to this rule is in certain tissues (bone and deep cellular planes) where rigid walls prevent the deployment of natural resistant forces, and where early incision may be of the utmost value in permitting expansion and the entrance of protective elements.

Among the means by which the patient's resistance to the invading organism may be supplemented, antiserums are first recommended. They should be given in large doses (60 c.c. daily), and commenced early. Copious fluid intake is an essential adjuvant to all such treatment. Transfusions are of benefit in a feeble or anæmic patient, although there is justifiable doubt as to how much benefit is due to the introduction of specific antibodies. Vaccines are of doubtful value except as a prophylactic in cases where operation for the removal of a large ulcerating growth may permit of a blood infection. It is the author's practice to give a preliminary course of B. coli and streptococcus vaccine in operations for removal of growths of the lower bowel. In chemotherapy, the search for a therapia sterilisans magna cannot yet be said to be successful, and the isolated cases with favourable results from the different dyes injected intravenously are not susceptible of accurate conclusions. Constant watch must be kept for abscess formation, in deep cellular planes, in joints, or in the pleural cavity. Such develop most insidiously in the later stages, and their timely evacuation may finally turn the scale. Only by systematic and regular examination will they be detected in many instances.

IAN G. MACDONALD

Brittain's Pathognomonic Sign of Gangrenous Appendicitis. La Roque, G. P., Am. J. M. Sc., 1931, 182: 191.

Le Roque has observed Brittain's pathognomonic sign of gangrenous appendicitis in 500 cases of this disease and has noted its absence in more than 300 other acute abdominal conditions, such as intestinal obstruction, cholecystitis, kidney and ureteral colic and functional colicky pains following dietetic indiscretions. In July, 1928, Dr. R. Brittain, an interne in the Richmond Memorial Hospital, made the original observation in a case which was later proved to be gangrenous appendicitis, that pressure over the appendix area (McBurney's point) resulted in retraction of the right testicle into the upper part of the scrotum. Since this observation the sign has been elicited in every case later proved to be gangrenous appendicitis. If the sign is absent the need for operation for this disease is not imminent. In widespread peritonitis, from whatever cause, one or both testicles may be retracted, remaining in that position regardless of the presence or absence of pressure over the appendix site.

E. S. MILLS

OBSTETRICS AND GYNÆCOLOGY

The Detection of Impending Intrauterine Death. Titus, R. S., Am. J. Obstet. & Gyn., 1931, 22: 382.

Impending intrauterine death may be detected in a small number of patients. Most of these cases will occur in diabetic, nephritic and toxemic patients, and in the eight-month habitual miscarrier. The possibility of detecting impending intrauterine death before it occurs depends upon more active, more intelligent prenatal care, more frequent office visits, and hospitalization in certain patients after the period of viability. Non-growth, or shrinkage of the uterus, and the presence of a decrease or no increase in weight are significant signs which point to impending intrauterine death. These signs should stimulate us to the consideration of the need of induction whereby a certain number of babies now lost might be saved.

Ross MITCHELL

Diet as a Prophylactic Agent Against Puerperal Sepsis. Green, H. N., Pindar, B., Davis, G., and Mellanby, E., *Brit. M. J.*, 1931, 2: 595.

Five hundred and fifty women attending ante-natal clinics of Sheffield and subsequently delivered in hospital were studied. Alternate women were given an extra supply of vitamins A and D during the later weeks of pregnancy. Of the vitamin-treated cases 1.1 per cent, and of the control cases 4.7 per cent, developed the British Medical Association standard of mor-

bidity. The results, classified on the basis of duration of pyrexia, also suggest that the vitamin preparation increased the resistance of puerperal women to infection.

An adequate supply of vitamin A must be given to the pregnant woman. Milk, egg yolk, green vegetables, carrots and butter should be taken unsparingly, as long as over-eating is avoided by reduction in the cereal and meat content to a level where a healthy appetite is developed. Mammalian liver is an excellent source of vitamin A, and should be included in the diet at least once weekly, unless otherwise contra-indicated. If a well-varied natural diet of this kind is taken, an adequate supply of the other important nutritional factors is assured. These include the other known accessory food factors—vitamins B (complex), C and D, together with the inorganic elements-calcium, phosphorus, iron, copper, manganese and iodine—all essential for the pregnant woman.

Where this complete diet cannot be taken for economic or other reasons, it should be supplemented by some preparation rich in vitamins A and D. Cod-liver oil is the cheapest source, but where a dislike to this oil exists a reliable commercial preparation rich in these vitamins is indicated. The best line of action is undoubtedly to regulate the diet during pregnancy and lactation along the lines indicated, and, if this is done, there may be no need for supplementary rich sources of the fat-soluble vitamins. Where social conditions are poor, however, or where the course of labour makes the occurrence of infection probable, some preparations of this kind should be of value as a prophylactic measure. The same course of dietary should also be adopted throughout the puerperium and lactation so as to further increase the resistance.

Ross MITCHELL

OPHTHALMOLOGY

Uveoparotitis (Heerfoordt). Merrill, H. G., and Oaks, L. W., Am. J. Ophth., 1931, 14: 15.

The cardinal signs of this comparatively rare affection are (1) iridocyclitis or uveitis, showing a great tendency to posterior synechiæ, with copious pigmentation on the anterior lens capsule, and the deep surface of the cornea; (2) bilateral, almost painless, but marked swelling of the parotid glands; this swelling is subject to exacerbations, is long continued, and finally undergoes complete resolution; the gland never suppurates; (3) a low grade chronic fever, especially manifest during the first half of the disease.

Of frequent, though not constant, occurrence, are paralysis of the cranial nerves, particularly the seventh, a prodromal rash resembling erythema nodosum, occurring especially on the

front of the legs and lower thighs, and sometimes on the forearms, a marked continued dryness of the mouth, polyuria without sugar, a prodromal malaise and sleepiness with frequent symptoms of gastric upset, and paresthesias and even paresis which may be in other than the cranial nerves. There seems to be no definite order of the appearance of the cardinal symptoms, but the similarity in cases thus far reported is such as to form a definite clinical picture. The eye abnormalities include misty vision, with more or less failure of sight, ciliary congestion, irregular or dilated pupils often without accommodation to light, nodules in the iris, vitreous opacities, sometimes optic neuritis or atrophy.

The authors report a case in detail, with an analytical tabulation of some 30 cases. As to etiology, the greatest diversity of opinion exists. Heerfoordt thought the cases were atypical mumps. Mohr ascribed the lesions to syphilis. Because of similarity in the character of the paralysis when it occurs, diphtheria has been considered as a cause. Mouth infection and tuberculosis have also been considered in this respect.

Little need be said as to therapy; it is symptomatic; atropine is however indicated. They conclude as follows. This group of cases forms a well defined entity. A further search of evidence for tuberculosis should be made, but, in the opinion of the authors, the weight of evidence to date points to some specific virus, bacterium, or agent as yet unknown.

S. HANFORD MCKEE

NEUROLOGY AND PSYCHIATRY

Mental Disorders Associated with Pernicious Anemia. Phillips, N. R., J. Ment. Sc., 1931, 77: 318, 549.

The frequency of the association of mental disturbance with pernicious anæmia is not The degree of the sufficiently recognized. mental affection varies greatly. There may be merely a modification of character, with irritability and changing mood, when the patient is apt to be uncooperative. In more pronounced cases, the psychosis most frequently met with is of the paranoid type, with delusions of persecution and suspicion, directed more particularly against those most concerned in the patient's welfare. The ability of a doctor to say that such symptoms are common in pernicious anæmia has convinced the court that an unfair will should be set aside. Delirium is also a frequent form of mental disturbance. Mental symptoms may appear at any stage of the disease, and are not limited, as formerly thought, to the later stages. They are to be regarded as secondary phenomena, and are curable to the extent that the underlying condition is curable. It is of great importance to remember that the mental symptoms may be so pronounced as to obscure the physical condition, so there should be a systematic examination of the blood in all cases where there is the least suspicion.

W. H. HATTIE

Blood-Sugar Studies in Abnormal Mental States. McCowan, P. K., and Quastrel, J. H., J. Ment. Sc., 1931, 77: 318, 525.

The authors maintain the importance of repeated tests and of taking into account such conditions as menstruation, toxæmia, endocrine unbalance, and a sufficient description of the mental condition of the patient under study. Importance is attached to a sustained hyper glycæmia; a curve is deemed normal when the sugar level returns to its fasting level within two hours. A hyperglycæmic index (H.I.) is described. From a study of 85 psychotic subjects it was concluded: (1) in the manicdepressive group there is a close parallelism between the magnitude of the H.I. and the emotional tension of the patient. Out of 43 melancholic patients only 10 gave a normal or slightly normal index; (2) in the schizophrenic group only 2 out of 29 showed a consistently high index; (3) in mania a low index is not recorded except when the excitement is accompanied by an aggressive paranoid mood; (4) in cases of benign stupor a low index is recorded; (5) arteriosclerosis per se is not a cause of high H.I.; (6) in both normal and psychotic cases the curve is disturbed during menstruation; (7) the H.I. may be of value in determining the prognosis.

W. H. HATTH

Significant Problems in Acute Anterior Poliomyelitis. Draper, J., J. Am. M. Ass., 1931, 97: 16, 1139.

Among the secrets of acute anterior poliomyelitis three "key-points" await solution: (1) the exact way or ways of transmission; (2) sure diagnosis before the virus invades the central nervous system; and (3) a satisfactory method of immunization. The paper deals particularly with the second point. Once the virus has entered and combined with its "prey-cell" in the cord, serum treatment is of no avail. Before signs of muscular weakness become apparent there is "clinical evidence that the anterior horn cells are already intoxicated, though not yet seriously injured. This is the stage of ataxic tremor and muscle twitching." Even then it may be too late to expect successful neutralizing results from the serum. "The brief interval of time between the moment of choroid plexus penetration and the moment of virus-cell union is the precious period during which the serum can be expected to neutralize

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the invading virus and so prevent paralysis." Intraspinal injections of serum while the fluid is still negative may break down the resistance of the choroid barrier, the natural effectiveness of which may be the important factor in protecting against paralysis. There is evidence that intravenous injections at this period may be helpful and are quite unlikely to be harmful, and the moment the fluid becomes positive serum should be administered intraspinally. Repeated spinal punctures enable one to determine almost the exact moment of the penetration of the choroid, as indicated by the fluid becoming positive. Then begins the "precious period" which intervenes before the onset of ataxic tremor—the period when serum therapy is most likely to succeed. Serum should, however, be given even though ataxic tremor is W. H. HATTIE present.

HYGIENE AND PUBLIC HEALTH

Acidophilus Milk. Frost, W. D., Butterworth, T. H. and Farr, S. M., Am. J. Pub. Health, 1931, 21: 862; Myers, R. P., ibid., 867; Kulp, W. L., ibid., 873.

The authors of the first of this leash of papers discuss the present status of acidophilus milk. After reference to Metchnikoff and the B. bulgaricus, the merits of what we were once content to call the Bacillus, but are now expected to term the Lactobacillus acidophilus, receive considera-This is the characteristic organism of the intestinal flora of bottle-fed infants. As the diet of children becomes mixed, their intestinal flora resemble more and more that of adults. In some adults, especially meat eaters, this flora is of the putrefactive type—in contrast to the much more desirable fermentative type of children and some adults. The claim that the fermentative type of intestinal flora can be secured by diet alone is not supported by our author, while several investigators maintain that massive doses of L. acidophilus taken regularly for days or weeks, especially with milk or certain carbohydrates, almost invariably establish that organism as predominant in the intestine. Milk cultures are usually to be preferred. "An acidophilus product of the highest quality is one in which an enormous number of L. acidophilus are present; these organisms must be viable at the time of consumption; and the strain must be one that is known to be readily implantable."

Myers considers the transformation of the intestinal flora through the feeding of unfermented acidophilus milk. Such a product, containing a high concentration of viable *L. acidophilus*, and yet retaining the taste and physical properties of rich whole milk, is now available. While marketed for immediate consumption, it will remain sweet and in good condition for seven days, if kept at 2 to 5° C.

It is claimed that the count of the lactobacillus does not decrease as rapidly in unfermented as in fermented milk, but the unfermented product is not stable unless it is kept cold. Favourable results have been obtained from its use in the human subject.

Kulp reports upon studies on the viability of L. acidophilus in acidophilus milk. There is general agreement that satisfactory therapeutic results depend on the use of cultures which contain large numbers of viable organisms. Acidophilus milk should contain at least 100,000,000 viable organisms per c.c. when it reaches the consumers, and from five to ten times that number at time of bottling, as the number diminishes rapidly under ordinary conditions of storage. As the results of his studies, which we cannot consider in detail, Kulp concludes that to preserve the L. acidophilus in milk which retains palatability two factors must be taken into account—assuming a minimum of contaminating growth. These factors are "initial acidity or some related metabolic substance, and storage temperature". Satisfactory viability up to one week may readily be secured without elaborate care in preparation, by storage at 5° C., provided acidity at time of bottling is not more than 0.65 per cent. For more durable viability the number of foreign bacteria must always remain at a negligible figure and rigid precautions taken against excessive acidity. The optimum viability temperature is given as 16° C. when the initial acidity is 0.65 per cent. W. H. HATTIE initial acidity is 0.65 per cent.

THERAPEUTICS

Pneumoperitoneum in the Treatment of Tuberculous Enterocolitis. Banyai, A. L., Am. J. M. Sc., 1931, 182: 352.

Banyai reports the treatment of 44 cases of tuberculous enterocolitis by means of pneumoperitoneum. The technique of the treatment is stated to be simple and free from danger. The time chosen was between breakfast and The site chosen was three fingers' lunch. breadth below and to the left of the umbilicus. The abdominal wall and peritoneum were infiltrated with 1 per cent novocain. A Floyd-Robinson needle was inserted obliquely into the abdominal cavity, pointing upwards and toward the midline. Oxygen was inserted from a standard pneumothorax apparatus. As regards the amount of oxygen injected, the subjective feeling of the patient is the best guide. Inflations are repeated at one to two week As a rule, from 500 to 1,000 c.c. intervals. were injected. The therapeutic effect of this procedure is considered to be due to the direct chemical influence of oxygen, the increased intra-abdominal pressure and the hyperæmia of the peritoneum and the intestinal serosa.

The results were classified as follows: thirty-

one patients noted symptomatic relief lasting from a few days to two years. Complete relief occurred in 14, partial relief in 10, and diarrhea ceased, while other symptoms persisted in 5. There was no relief in 13, or about 30 per cent of the cases. Banyai believes that this treatment is of prime importance because it gives prompt symptomatic relief in most cases and restores normal motility in the intestinal tract.

E. S. MILLS

The Use of Stramonium in Parkinson's Disease and Parkinsonism. Menard, O. J., and Hurxthal, L. M., N. Eng. J. Med., 1931, 205:

The results achieved in the treatment of a series of cases by the administration of stramonium, as first advocated by Juster, are presented. Other drugs of the same group have been used in similar cases, e.g., hyoscine and more recently atropine. Any treatment that will relieve the distressing condition of cases of Parkinson's disease or Parkinsonism of encephalitic origin is worth considering. There are clinical differences between the two conditions and generally speaking cases of paralysis agitans respond much less favourably to treatment.

The authors recommend the use of the powdered leaves rather than the tincture, beginning with 21/2 grains t.i.d., and gradually increasing to as high as 15 or 20 grains daily. Little benefit is noted with the smaller doses, but too rapid increase leads to unpleasant dryness of the mouth and blurring of vision. The former can be alleviated by the use of citrus fruits and candy. Muscular rigidity, mental retardation, and excessive salivation are always relieved, and considerable improvement in general health is noted. The tremour of true paralysis agitans is not greatly changed, nor is there much effect on the "mask facies". It may be that the early use of the drug may retard the onset of the disfiguring upper dorsal round back so often noted in advanced cases.

A. T. MATHERS

RADIOLOGY

Roentgenography in Brain Tumours. Gershon-Cohen, J., Am. J. Roentgenol., 1931, 26: 414.

The writer presents his conclusions from the study of series of 221 tumours removed at operation or autopsy. Sixty-five of these were in or around the pituitary fossa and of these 58 were localized by x-ray. A combination of clinical and x-ray methods resulted in a correct localization in 98.5 per cent of the cases.

In this pituitary group the roentgenological signs, in order of frequency, were: alteration in shape and size of sella, 90.8 per cent; atrophy

of the dorsum sellæ and post. clinoid processes, 80.5 per cent; atrophy of ant. clinoid processes, 7.7 per cent; unilateral erosion of the floor of the sella, 6.2 per cent.

The cerebral group contained 97 cases, of which 56.7 were diagnosed from roentgenological examination, 26.8 per cent from it alone. In 24.7 per cent of the cases valuable confirmatory evidence was yielded by x-ray examination. The diagnostic signs of most value were: tumour calcification in 11.3 per cent; local bone atrophy, 12.4 per cent; local bone hyperostosis, 6.2 per cent; signs due to increased intracranial pressure, atrophy of dorsum sellæ, 29.9 per cent; dish-shaped sella, 8.2 per cent; convolutional atrophy, 11.3 per cent; diastasis of sutures, 4.1 per cent; prominence of diploic channels, 16.5 per cent; wide arterial grooves, 5.3 per cent.

Fifty-nine cases comprised the cerebellar group. Of these 81.4 per cent were correctly diagnosed clinically, whilst in only 50.8 per cent were there positive radiological findings. In this group all the radiological signs were those associated with increased intracranial

pressure, as listed in the table above.

As for technique, special pains were taken to avoid overexposure; substances opaque to rays such as dentures, hair pins, etc., were removed from the field. Stereoscopic, anteroposterior, postero-anterior and sella plates (at 36 inches) were routinely taken, the Potter-Bucky diaphragm being used for all except the sellar plate. Certain special techniques for study of the petrous ridges, internal auditory meatus, anterior fossa, and optic canals are mentioned.

A. T. MATHERS

Experimental Studies on the Biological Action of X-rays. Kikuchi, S., Tohoku J. Exp. Med., 1931, 17: 545.

The effect of x-rays on the blood constituents may be through action on the tissues, or upon the vegetative nervous system, or stimulation of the vagus. To determine this question dogs were used, some of which had had the splanchnic nerves, and others the vagi severed. Different doses of x-rays were given over various regions, and full chemical analyses of the blood were made (blood-sugar, lactic acid, H-ion concentration, serum albumin, total N. residual N, serum-chlorides, inorganic phosphoric acid, acetone bodies). Some of these were at first diminished and increased later, others the converse.

In the normal dog, x-rays always produce hyperglycæmia, which disappears in 24 hours. After section of the splanchnics, the glucose is very much diminished (20 to 30 per cent), regardless of the dose; lactic acid is not increased, even if the liver-region be exposed to the rays.

Acetone bodies are unaffected. After section of the vagus, an increase of glucose is observed, to 30 per cent, if the liver-region be rayed, to 21 per cent if the splenic region, and 18 per cent if the thighs. Lactic acid is slightly increased at first, and diminishes later.

If pancreatic hormone be given parenterally, the blood-sugar and lactic acid fall under x-rays, if the splanchnics are cut. The fall must therefore be due to an action on the pancreatic hormone by the vagus irritation set up by x-rays.

O. C. GRUNER

Obituaries

Dr. Frederick Bruce Mowbray died with startling suddenness at the Hamilton General Hospital on Wednesday, November 11, 1931, having just completed a major operation. His death at the zenith of his career as a surgeon was quite unexpected.

Doctor Mowbray was born at Thamesville, Ont., in 1883. He graduated in Medicine from the University of Toronto with the class of 1905. He served his



Dr. Frederick Bruce Mowbray

interneship in the Erie County Hospital at Buffalo, N.Y., and in 1906 entered general practice at Palermo, Ont., as an associate of the late Doctor Buck. Here he spent six years in a busy general practice, during which time the thoroughness with which he entered into his work laid the foundations of his later success as a surgeon. In 1912, he went to Berlin to do post-graduate work in surgery, remaining till the end of 1913. While there, he was made president of the American Medical Association of Berlin, which was an association of post-graduate students from Canada and the United States studying at the German capital. After visiting various other medical centres in Europe, he returned to Hamilton at the end of 1913 and started practice as a general surgeon. In 1915, he, with Dr. J. K. McGregor, formed

a group from which developed in 1920 the McGregor-Mowbray Clinic. His life was one of intensive study and activity in his profession. He made in all six trips abroad for post-graduate work.

Doctor Mowbray was married in 1913 to Miss Mathilde Hoeven, who with two children, Christine and Jack, survive him. He is also survived by a widowed mother, two sisters and three brothers.

He was a Fellow of the Royal College of Surgeons of Canada, and of the American College of Surgeons. He was a member of the Canadian Medical Association, the Ontario Medical Association, and a past-president of the Hamilton Academy of Medicine, and a member of the American Association for the Study of Goitre. He was an examiner in surgery for the Medical Council of He was a senior surgeon in charge of one of the surgical services at the Hamilton General Hospital. He was on the consulting staff of the Mountain Sanitarium and of St. Joseph's Hospital. Since 1920, he had been associated with Dr. J. K. McGregor in the direction and operation of the McGregor-Mowbray Clinic. He was a member of the Hamilton Club, of the Victoria Curling Club, and of the Burlington Golf and Country Club. He was a 32 degree Scottish Rite Mason and held office in the Moore Consistory, one of the Scottish Rite bodies. He had taken a great interest in sport and at the time of his death was president of the Hamilton Tiger Football Club.

Doctor Mowbray was a confirmed optimist. He met every vicissitude of life with cheerfulness. He had great charm of personality and was very charitable in his judgment of others. His multitude of kindly actions, many of which were unknown even to his friends, exercised a great influence on those with whom he came in contact. Many a young physician will miss the kindly interest and assistance and the sound advice which he always rendered so freely. He was loyal to his friends and straightforward with all. His outstanding characteristic was his modesty. He possessed surgical skill to such a degree that he was among the best general surgeons on the North American Continent. He possessed that rare combination of powers, viz., keen observation, quick mental adjustment, and prompt decision. His qualities of mind and heart recall the words of Rudyard Kipling who addressed the Royal College of Surgeons of England some years ago and said in part:—

"Is it any wonder, gentlemen of the College of Surgeons, that your calling should exact the utmost that man can give-full knowledge, exquisite judgment, and skill in the highest, to be put forth, not at any selfchosen moment, but daily at the need of others? More than this. Your dread art demands that instant, impersonal vision which in one breath, one beat of the pulse, can automatically dismiss every preconceived idea and impression, and as automatically recognize, accept, and overcome whatever of new and unsuspected menace may have slid into the light beneath your steadfast hands. But such virtue is not reached or maintained except by a life's labour, a life's single-minded devotion. Its reward is not only the knowledge of mastery and the gratitude of the layman, which may or may not bring content. Its true reward is the dearly prized, because unpurchasable, acknowledgment of one's fellow-crafts-

Dr. Gustave Archambault, of Montreal, died on November 15, 1931, at the age of 48. Doctor Archambault was a well-known medical practitioner in the city, and during the war acted with distinction as second in command of the Laval, No. 6, General Hospital in France. For his services there he was created a Chevalier of the Legion of Honour and an Officer of the Academy.

Born in Montreal, Doctor Archambault was a son of Dr. Gaspard Archambault and was educated at St.

Mary's College. He graduated at Laval University in medicine in 1905 and, going to Paris to continue his studies, remained there for four years.

On returning to Montreal he specialized in the treatment of skin diseases and was in charge of the university clinic. He was a consulting physician in the St. Jean de Dieu Hospital and at the Bruchesi Institute; he was a member of the Provincial Council of Hygiene and of many medical societies.

In 1915 he joined the Laval hospital unit of the C.A.M.C., and served until 1919, his unit being attached to the French army.

He is survived by his widow, formerly Miss Fernande Lemay, one son, Claude, and four brothers, Rev. Father Papin Archambault, Mr. Justice Joseph Archambault, Dr. Léon and Gaspard Archambault, C.E.

Dr. John C. Bell. We regret to report the death, recently, of Dr. John C. Bell, at the age of 76 years, at Strathroy General Hospital, Ontario. Doctor Bell was a graduate of Trinity College and practised in Norfolk County during his entire medical lifetime. His son Dr. J. A. M. Bell, of Newcastle, N.B., is the President of the New Brunswick Medical Society and to him is extended the sympathy of his confrères in the province.

Dr. Richard Smith Conboy, of Toronto, died suddenly on October 24, 1931, at his residence.

Dr. J. A. Currie, of Sydney, after a protracted illness, died at the home of his brother-in-law, Mr. Dan McLeod, Baddeck, on September 6, 1931. The deceased was born in Port Morien and was in his 45th year. He was a graduate of Dalhousie University (1916) and practised in Glace Bay. He served overseas in the War and then located in Sydney.

He is survived by his wife, formerly Miss Sadie McLeod, R.N., of Baddeck, and three children, who have the sympathy of the community in their great loss, in which members of the medical profession will join.

Dr. Thomas Francis McMahon died on October 25, 1931, at his home, 75 Castle Frank Road, Toronto, in his seventieth year. He was taken ill two months ago at his summer home, Lake Simcoe. Some thirty years ago he had his office at Bathurst and Adelaide Streets, and he was greatly beloved by the poorer residents of the district, from whom he refused to accept fees for his services. While he was a resident of St. Mary's Parish and a well-known Catholic layman, he gave his services freely also to the people of St. John's Garrison Church and those of other churches in the neighbourhood. From Bathurst Street he moved to St. George Street, and ten years ago took up his residence at Castle Frank.

Doctor McMahon for thirty years was Medical Referee for the Manufacturers' Life Company and was also identified with the Mutual of Canada, the Equity and the Capital. He was the first Canadian President of the Life Insurance Medical Directors of America. He was also much interested in the Academy of Medicine, of which he was a life-member. Educational affairs claimed his attention some years ago, when he was a member of the Separate School Board. Doctor McMahon is survived by his widow and two daughters, Miss Dorothy McMahon and Mrs. Justin Robinson.

Dr. Alfred Coyne Phillips died at Regina on October 19, 1931.

news 3tems

Great Britain

A Great Scientist's Recreation.—In celebrating the centenary of the birth of James Clerk Maxwell, Cambridge University honoured the achievement of one of its most famous sons. Clerk Maxwell was the first Cavendish Professor of Experimental Physics, and first Director of the Cavendish Laboratory. It was there that he formed his theory of electrical waves. The Master of Trinity, Sir J. J. Thomson, in a centenary address, gave some personal anecdotes of Maxwell. When he went to Edinburgh Academy as a boy of 10 he was anything but a success, and was known to his schoolfellows as "Dafty." In those days, said Sir J. J. Thomson, we first heard of a game which Maxwell played throughout his life and which all his friends associated with him. One name for it was "diabolo," but it was usually called the "devil on two sticks." Maxwell attained great skill with it, and no doubt it led him to the construction of his dynamical top, by which he demonstrated in a striking way the properties of bodies in rotation.

Bendien Method of Cancer Diagnosis.—The investigation Committee of the British Empire Cancer Campaign has inquired into the Bendien method of diagnosis for cancer, and finds that, although the preliminary results were encouraging, subsequent inquiries have failed to justify the early promise. The Investigation Committee, therefore, has come to the conclusion that the Bendien method of diagnosis for malignant disease cannot at the present time be accepted as reliable.

Royal College of Physicians of Edinburgh.—At a meeting of the College held on Wednesday, October 14, 1931, Sir Norman Walker, President, in the chair, it was resolved that, in view of the national situation, the ceremonies in connection with the celebration of the 250th anniversary of the foundation of the College be postponed to a future date to be determined by the College.

The James Mackenzie Memorial.—On September 26th last the memorial to Sir James Mackenzie was unveiled at a public ceremony. The memorial takes two forms—a plaque on the wall of the house, 68 Bank Parade, Burnley, in which James Mackenzie lived for many years, and a bronze bust, placed in a niche in a monument of Darley Dale masonry provided by the town council, and erected in Thompson Park. The plaque was unveiled by Lord Amulree, Secretary of State for Air, Sir James Mackenzie's brother, and the bust by Lord Moynihan. The plaque bears the following inscription:—

Sir James Mackenzie, M.D., LL.D., F.R.S., F.R.C.P., 1853-1925. Who achieved fame by his researches in connexion with diseases of the heart, was from 1879 to 1907 a general practitioner in Burnley and lived in this house.

The Historical Pageant Play "Rahere".—No other setting than the institution Rahere founded more than 800 years ago could possibly have been more suited to the historical pageant-play "Rahere," which opened in St. Bartholomew's Church, Smithfield, on October 19th.

The story of Rahere, once master of revels to King Henry I., who, after a visit to Rome, where he was miraculously healed of an illness, became founder of St. Bartholomew's Hospital and Church, is comparatively well known, but it is a tale of such tender-

ness and accomplishment that repetition, in surroundings of such dignity and beauty, far from detracting

from it only tends to enhance its value.

The play has been entirely re-written by Mr. J. Scott-Rogers, and, as now enacted, it presents a far more comprehensive story of this great benefactor's life. The difficult rôle of Rahere was filled with wonderful sincerity by Mr. John Wyse, who was also responsible for the direction of the production.

The action of the play commences in the Palace at Westminster. Mr. Tom Heslewood portrayed the King with the necessary severity and dignity. The action then moves to an Augustinian monastery near Rome, and proceeds finally to the market at "Smooth-

field" at Christmas time.

The producer was Miss Ida Teather, who has had considerable experience in the production of religious drama on the Continent, where she worked under Reinhardt. Nearly the whole cast was composed of West-end players.

Alberta

Some municipalities, being without the services of physicians, have under consideration the question of assuming the responsibility placed on them by the provincial legislature in the matter of appointing medical officers of health who will care for indigent patients. When this has been agreed to, the physician will look after the accounts of his private patients himself. It is very doubtful when the Medical Health Act was being drawn up whether physicians foresaw the fact that agreeing to answer all professional calls would involve travelling thousands of miles and bearing large costs of transportation as it does to-day. Going around the village on house to house calls was quite different to rendering your personal services in a thinly settled rural area such as is found in western Canada at the present time.

Dr. G. A. Davidson, of the Brandon Mental Hospital, has been appointed assistant superintendent of the Alberta Mental Hospital at Ponoka. He will be in charge of medical services at this hospital.

Dr. C. A. Barager is Acting Superintendent, temporarily combining this duty with his larger activities as Commissioner of Institutions, and Director of Mental Health. The new appointment was made necessary by the resignation of Dr. E. H. Cooke and the transfer to Red Deer from Ponoka of Dr. D. L. McCullough as Acting Superintendent. Dr. Davidson is a graduate of the class of 1921 of the University of Manitoba. He was for some time an interne at the Winnipeg General Hospital and following this took post-graduate work in psychiatry in Boston and in New York. On his return he was appointed physician in charge of wards at the Brandon Mental Hospital. In 1929 and 1930 he spent fourteen months in London.

Owing to the presence of trachoma in certain districts in Alberta the provincial government have made certain additions to the public health regulations to prevent the spread of this disease. These regulations now provide that all persons suffering from or suspected to be suffering from trachoma shall be subject to restrictions as far as isolation is concerned, as the Provincial Board of Health or medical officer acting on its behalf may find necessary. Any house in which a person suffering from trachoma is found, and where proper precautionary measures are not being observed, may be placed under quarantine. When in the opinion of the Provincial Board of Health, the

regulations continue, treatment is necessary for the mitigation and suppression of trachoma, such board may appoint such medical and nursing staffs as may be deemed necessary to provide a systematic course of treatment in order to procure eradication of the disease from any area within the province. The Provincial Board will determine what proportion of the expenses incurred in carrying out the provisions regarding medical staffs will be borne by the district concerned and what proportion will be borne by the government, and such sum payable by the municipality will be a debt due by the municipality to the govern-

ment and payable on demand.

At the Morley Stoney Indian reserve, situated west of Calgary, about one-quarter of the population of six hundred are afflicted with trachoma. children in the school at Morley are under treatment for this disease, while 6 adult Indians are blind and 18 more are likely to lose their sight as the disease is so far advanced. The seriousness of the situation can better be understood when it is realized that the Indians travel a great deal through other districts. Due to the fact that the reserve cannot support the population the Indians have to go to other parts to earn their livelihood. Treatments were given them, earn their livelihood. but they have not carried out the directions for using the drugs, as they are used once a week or once a month or not at all. It has been reported that they more often use an infusion of various herbs or follow the old method of "blood letting" by cutting the skin to allow "the devil to escape". Compulsory treatment and quarantine of the reserve will be necessary if headway is to be made. There is a hospital building on the reserve and this could be made use of and the Indians compelled to go for treatments Two years ago the attention of the periodically. Department of Indian Affairs at Ottawa was called to the trachoma situation on Indian reserves, and Dr. Wall, of Ottawa, was commissioned to visit all reserves and submit a report. He found that trachoma was present in every Indian reserve in Saskatchewan, Alberta and British Columbia. The Department of Indian Affairs took no steps to prevent the spread of the disease other than to supply the Indian agents with medicines which the Indians declined to use.

Early in November it was stated that about 60 children were undergoing treatment at the school at Hanna, and in the Brainerd school district, about 40 suspects are being treated. According to Dr. S. E. C. Argue, Medical Officer of Health at Hanna, suspects must be treated or be quarantined. In Hanna, a nurse from the Provincial Department of Health is directly in charge of the work, under supervision of the medical officer of health. Trachoma was discovered in a patient in the Hanna district early last September and the school board requested an examination by the Provincial Health Department representatives.

The Cancer Committee of the Alberta Medical Association passed a resolution requesting the Provincial Legislature to make cancer a notifiable disease.

The College of Physicians and Surgeons of Alberta has announced that elections will shortly be held for representatives on the council for the years 1932 and 1933 (a two-year term) in the following districts: Medicine Hat, Banff, Red Deer, Peach River and Edmonton. It was decided some years ago that all councillors be elected for a two year term, and as there were seven councillors, that three were to be elected one year and four the next, thus having elections every year in some of the districts. If the members of the council had not properly interpreted the wishes of the members of the profession, the latter have had a chance each year at the annual meeting to so express themselves.

On October 6th the physicians of Calgary and outside districts had the pleasure of listening to several instructive lectures, given by the professors of anatomy and physiology, at Toronto and McGill Universities, Professors J. C. B. Grant and C. H. Best of the former and Professors S. E. Whitnall and J. Tait of the latter university.

Prof. S. E. Whitnall discussed the subject of "Fascia, its forms, functions and fallacies". Prof. J. C. B. Grant: "Joints"; Prof. C. H. Best, of "Some practical applications of recent physiological results" and of "Recent advances in the knowledge of carbohydrate metabolism", and Professor Tait the subject of "Some new considerations relating to the problem of hearing."

The last of the post-graduate tours of this year under the grant to the Canadian Medical Association began on November 3rd and ended on November 17th. The visiting team consisted of Drs. Gordon A. McLarty and C. Stewart Wright, both of Toronto. Medicine Hat, Letheridge, Calgary, Drumheller, Hanna, Stettler, Red Deer, Edmonton, Camrose and Wainwright were visited.

The meetings at Calgary were held during the morning and evening of November 6th, at both of which there was a large attendance of the physicians of the city and nearby districts. Both meetings were held at the Holy Cross Hospital.

The subjects chosen by the lecturers were of much practical importance and of much interest to the general practitioner.

Doctor McLarty's subjects were "Psychiatry from the standpoint of the general practitioner"; "The examination of a neurological case"; "The treatment of the psychoneuroses". These lectures had a special appeal for the physician and the subjects were judiciously handled.

Dr. C. Stewart Wright gave two lectures, one on "Back pain with special reference to sacro-lumbar and sacro-iliæ lesions", the other on "Personal experiences in the investigation and treatment of chronic arthritis, infections and diet considered". Both lectures were illustrated by lantern slides. Doctor Wright is to be congratulated on the marvellous results which he has obtained in the treatment of chronic arthritis, since there were, mirabile dictu, in 75 per cent a cure, and in 95 per cent relief from pain, which are epochal, since no one to our knowledge has ever approached these utopian figures. His lectures created a profound impression on his hearers.

G. E. Learmonth

British Columbia

At the last session of the Legislature, in the spring, certain amendments dealing with the chiropractors and other irregular cults were brought forward. At that time it was urged by the medical profession that before any action was taken, the whole question should be referred to a Royal Commission. This was promised by the government, and after various delays an order-in-council was passed appointing Hon. Mr. Justice Murphy as Commissioner. Recently the text of the commission has become available, and as it may be of interest to the profession the following clauses are appended.

"Whereas there are divers persons who have carried on the practice of Chiropractic in British Columbia for a substantial period of time,

"And whereas the provisions of section 33 of the Medical Act have never been invoked, and there is a controversy about the efficacy and fairness of the said section, it is deemed expedient to inquire as follows:—

"First: (a) To ascertain (or to determine by

what means it should be ascertained) who of those now practising as chiropractors in the province are duly qualified chiropractors within the meaning of the Medical Act. (b) To inquire whether or not any or all of the recognized schools or colleges of chiropractic, within the meaning of the Medical Act, of which the said duly qualified chiropractors now practising in the province are graduates, give courses in the subjects required for the practice of chiropractic, which are adequate to protect the public when undergoing from such persons treatment solely confined to the practice of chiropractic. (c) To recommend such legislation as may be deemed requisite to provide for the registration of such duly qualified chiropractors now practising in the province, so that their practice for reward may be legalized, when confined solely to chiropractic, and to provide for their control and regulation in the interest of the public.

"Second: To recommend in the interests of the public the method of determining the qualifications to permit subsequent applicants to practice chiropractic, including the Board by whom the same shall be determined, and the method and the extent of the examinations of such applicants; and in particular, whether or not such qualifications shall be determined and the examinations set by a Board comprised solely of those duly qualified chiropractors already authorized to practise, or by a Board comprised in part of members of the College of Physicians and Surgeons.

to practise, or by a Board comprised in part of members of the College of Physicians and Surgeons.

"And whereas His Honour the Lieutenant-Governor, by and with the advice of his Executive Council, hath deemed it expedient to cause an inquiry to be made into the extent and nature of the practice of drugless healing (other than chiropractic) in all its branches in the Province of British Columbia, and the nature of the legislation which may be necessary or advisable for the purpose of regulating and controlling the registration of drugless healers in the Province of British Columbia, and generally into all matters properly incidental to the foregoing," etc.

It should be explained that under existing legislation, the chiropractors may apply to an examining board appointed in part by the University of British Columbia, and in part by the Council of the College of Physicians and Surgeons, a privilege of which the chiropractors have never availed themselves. So far from providing an investigation of the humbuggery which masquerades as chiropractic, the commission above, though somewhat ambiguous, seems designed to protect that strange product of quackery from any investigation as a system, though apparently its present representatives in this province are not afforded the same immunity.

On October 28th, the Hon. S. L. Howe, Provincial Secretary, formally opened the new wing of St. Paul's Hospital. The ceremony was preceded by a luncheon, at which representatives of the government, city, clergy and medical profession were guests.

Steps are being taken to bring into being a metropolitan health board, embracing all municipalities of the Fraser Valley and lower mainland. Dr. H. E. Young, Provincial Health Officer, recently spoke in favour of the scheme. It is expected that expert advice from the Rockefeller Foundation will be obtained in the working out of the scheme.

At the recent examinations of the provincial Graduate Nurses Association eighty-six nurses were successful in obtaining the title of R.N.

Two men posing as eye-specialists were recently convicted in New Westminster of obtaining money by false pretences. In five instances they had success-

fully posed as eye specialists, and for fake operations for cataract they had collected in all \$1,355. In sentencing each of them to five years in the penitentiary, the judge spoke of their conduct as cruel and cowardly.

Commenting on an apparent increase of cases of tuberculosis in September, the health officer of Vancouver, Dr. J. W. McIntosh, points out that the rise from 19 cases in September, 1930, to 58 in the same month this year is due rather to complete reports than to any actual increase of the malady.

Charges against five irregular practitioners, for illegally using the title "Doctor", were recently adjourned, on representations of defense council that the whole question of irregular practitioners is shortly to be made the subject of enquiry by a Royal Commission. Decision was reserved by the magistrate, after hearing argument.

On October 30th Dr. A. S. Monro, President of the Canadian Medical Association, was tendered a dinner by the members of the local committees, having to do with the recent annual meeting. An evening replete with cheer and wit was suitably graced when Dr. Monro was presented with a sterling silver salver.

A syndicate has been approaching members of the profession in British Columbia, regarding a scheme of health insurance, which would provide sick benefits and medical services to its subscribers, on terms such as might be furnished by a State scheme. The proposals are being investigated by the British Columbia Medical Association.

The College of Physicians and Surgeons of British Columbia has agreed with the Medical Council of Canada to forego a fee of \$25, which has in the past been received from that body, for each candidate taking the M.C.C. examinations, and subsequently registering in this province. To compensate for the loss of revenue from this source the College announces that it will be necessary to increase the annual dues of members of the College.

C. H. BASTIN

Manitoba

The annual St. Luke's Day service of the Winnipeg Medical Society was held at Holy Trinity Church on October 18th. The Rector, Rev. Canon Carruthers, conducted the service and Dr. H. M. Speechly read the lessons.

The Brandon and District Medical Society held a meeting at Manitoba Sanatorium, Ninette, on October 21st.

The regular monthly meeting of the Winnipeg Medical Society was held in the Medical College on October 23rd. Dr. O. S. Waugh read a paper "A study of 114 cases of fractured skull," which was discussed by Dr. A. T. Mathers; and Dr. C. W. Burns presented a case report of "Volvulus of the stomach."

The new wing of the Portage la Prairie General Hospital was officially opened on November 3rd with a service conducted by the directors of the hospital assisted by the clergy, representative public men and Hon. Dr. E. W. Montgomery, Minister of Health. Mr. E. A. McPherson, K.C., acted as chairman.

Dr. W. Harvey Smith and Dr. E. J. Boardman appeared before the special health committee of the Legislative Assembly on October 27th, and urged a more equalized distribution of the cost of medical care.

Dr. T. A. Pincock, Superintendent of Brandon Mental Hospital, gave the address at the Armistice Day service at the Medical College.

An Executive meeting of the Manitoba Medical Association was held October 22nd. The following were appointed to the Editorial Board of the Canadian Medical Association Journal for the coming year: Drs. J. M. McEachern, Chairman, Winnipeg; S. J. S. Peirce, Brandon; Ross Mitchell, Winnipeg; E. S. Moorhead, Winnipeg; Lennox Bell, Winnipeg.

Excavation work for the new building of the Brandon Mental Hospital got under way early in November. The new building will be three stories in height and of brick and concrete construction. It will be the fourth building of the Brandon Hospital group, will harmonize architecturally with the other buildings and will be used for the accommodation of female patients. It will cost \$140,000 and the work will be done on a joint relief basis with the Dominion contributing 25 per cent and the Province 75 per cent of the cost.

ROSS MITCHELL

New Brunswick

On October 16th, the new Saint John General Hospital was opened for patients. The transfer from the temporary hospital to the new one was made in the period of less than three hours. The staff work entailed in this move was in the hands of Dr. Wm. Baxter, Chief Interne, assisted by the remainder of the interne staff Nursing arrangements were in charge of Miss Margaret Murdoch, Superintendent of Nurses. Business details were handled by Mr. R. H. Gale, Superintendent. Local authorities were loud in their praise of the arrangement which resulted in a non-eventful transfer with great rapidity.

The new hospital provides a degree of comfort and efficiency impossible in the previous building. The Surgical Department is provided for on the eighth floor where a series of operating rooms are in charge of Miss Louise Bartch. The new Obstetrical Department, which is an innovation in the General Hospital, is arranged in the best manner and is to be under the supervision of Miss Jennie Stevenson, R.N. The remaining departments in the hospital are staffed as previously. The present nurses' home which served as a temporary hospital during building operations is now being completely renovated and repainted. The addition of this most modern hospital to the municipally owned group in Saint John is a decided advantage to the profession of medicine in our province.

Extra-mural meetings for the month of October were held at Fredericton, St. Stephen, Saint John, Moncton and Bathurst. The meetings were well attended and the interest in the papers presented was particularly acute. Dr. T. A. Robinson, of Toronto, spoke on the "Significance of pain in the lower abdomen". Dr. Trevor Owen, of Toronto, chose as his subject the "Analysis of cough in respiratory disease, with special reference to treatment". Both papers were treated in the manner of the medical detective, taking the symptom described as a clew and working backwards by induction to the cause with subsequent measures for relief.

Dr. W. H. Coffyn, of Bathurst, was elected to represent Gloucester County in the local legislature at a recent by-election.

Dr. Fred. Cheesman, a recent graduate of Dalhousie, is now practising at Saint George, New Brunswick.

Dr. J. A. M. Bell, of Newcastle, passed through Saint John recently on his way to Boston for some post-graduate work.

The private hospital of Dr. P. C. Laporte, situated at Claire, N.B., was destroyed by fire early in November. The destruction was complete and included the doctor's surgical and x-ray equipment as well as his medical library. At one time, this hospital was one of the Red Cross outposts.

The report of the American College of Surgeons' Hospital Division contains the approved list of hospitals. Included in this group, thirteen of the major hospitals in New Brunswick have been given complete approval. Two others are put on the conditioned list.

A. STANLEY KIRKLAND

Nova Scotia

Doctors Curry and MacDermot included Antigonish, Sydney and Truro, as well as Amherst, in their tour and were accompanied by Dr. S. L. Walker, General Secretary of the Medical Society of Nova Scotia. At Truro they were joined by another team made up of Dr. C. K. P. Henry, of Montreal, and Dr. Gerald R. Burns, of Halifax. This team visited also Bridgewater, Yarmouth, Bridgetown and Yarmouth. Dr. Henry had lectures on cancer, peptic ulcer, and surgical goitre, of which he gave two at each place visited. Dr. Burns dealt with the early diagnosis of tuberculosis and essential hypertension. In Dr. MacDermot's lectures special attention was given to the allergic factor. Dr. Curry illustrated his lectures with films demonstrating spinal anæsthesia and septic conditions of the hand.

On the evening of November 2nd the Seventh (Dalhousie) Stationary Hospital unit met in its thirteenth reunion at a dinner held at the Nova Scotian Hotel. There was a large attendance of officers, nursing sisters and men. The occasion was made notable by the presentation to its first commanding officer, Col. John Stewart, of a fine portrait executed by Mr. John McGillivray. There was universal expression of regret for the absence of Col. E. V. Hogan, who succeeded Colonel Stewart in command. Colonel Hogan was unable to be present on account of illness. He has been a patient at the Victoria General Hospital for some time, where, to the great satisfaction of everyone, he is making good progress.

A recent issue of the Royal Gazette notes the appointment of Dr. F. R. Little, of Halifax, to the Nova Scotia Power Commission.

Dr. K. P. Hayes, of Sydney Mines, has gone to New York to spend several months in the pursuit of graduate studies.

Mr. A. Hanfield Whitman, of Halifax, has been appointed to the Board of Commissioners of the Victoria General Hospital, by the provincial government. Mr. Whitman success the late Hon. George E. Faulkner on the Board.

Miss Gladys H. Suliss has been appointed superintendent of the Payzant Memorial Hospital, Windsor, in succession to Miss Margaret Martin, whose recent sudden death was referred to in a previous issue of the Journal.

Dr. George Kerr Thomson, Dean of the Faculty of Dentistry, Dalhousie University, was tendered a complimentary dinner by his Halifax colleagues on October 6th, to mark his return from the International Dental Congress at Paris. Dr. Thomson represented Dalhousie University, and was one of three representatives of the Dominion Government at the Congress.

The Halifax Branch of the Medical Society of Nova Scotia opened the session by a dinner meeting at the Nova Scotian Hotel on the evening of October 14th. There was a large attendance of members, and the function proved to be particularly enjoyable. In his presidential address Dr. Frank Mack gave a most interesting review of the history of urology. The program outlined for the winter is very attractive and augurs well for an unusually successful session.

W. H. HATTIE

Ontario

Seven men were fatally injured and two others are likely to die as a result of the fire which swept through a dormitory cottage at the Ontario Hospital at Penetanguishene early in the morning of November 2nd. All victims were patients at the hospital. Rolling clouds of smoke through which the firemen had to fight with gas masks, screams of terrified patients who resisted the efforts of their rescuers, and a grim procession of stretchers which carried away inert forms, made a terrifying scene as two fire brigades and the hospital staff fought the blaze in the early dawn.

As a precaution against the spread of the flames to other buildings, hundreds of patients were taken from their dormitories and marshalled in the grounds. No explanation of the fire has yet been received. Only the bravery of doctors and nurses who were forced to drag the violent patients from the building prevented the casualty list being much larger.

Announcement has been made that Dr. Donald R. Fletcher, Inspector of Mental Hospitals, has been appointed to the superintendency of the Ontario Hospital, Brockville, succeeding Dr. Walter M. English who is retiring from the government service after almost a quarter of a century in provincial institutions.

Dr. Fletcher was born at Flesherton, Ontario, is a graduate with distinction of the Medical School of Queen's University (1916), and served overseas in both France and Egypt with the Canadian Army Medical Corps. Returning from the war, he joined the Ontario hospital service at Brockville. He was later transferred to Toronto, becoming assistant superintendent in 1925 and serving in that capacity until 1930, when he was awarded a Fellowship by the Canadian Committee for Mental Hygiene and spent some months in Boston.

for Mental Hygiene and spent some months in Boston.
Dr. W. M. English, the retiring Brockville superintendent, will spend some time in Europe after relinquishing his duties.

St. Joseph's General Hospital at North Bay was formally opened by the Hon. Dr. J. M. Robb, Minister of Health for Ontario, on October 7, 1931.

On October 16, 1931, several thousand persons visited St. Joseph's Hospital, London, where the new wing was officially opened by the Hon. Dr. J. M. Robb, Minister of Health for Ontario, and the Right Reverend T. J. Kidd, D.D., Bishop of London. The addition provides 115 beds with a complete new obstetrical department, operating rooms for eye, ear, nose and throat cases, a children's department, a complete laboratory suite, including a pathological museum for the instruc-

tion of students, which is the only one of its kind in western Ontario. There are also new dining quarters for physicians and nurses.

On November 12th, the new nurses' home and boys' dormitory at the Ontario Hospital, Orillia, was formally opened by the Hon. Dr. J. M. Robb, Minister of Health for Ontario, the Hon. J. D. Monteith, Minister of Public Health, and the Hon. William Findlayson. Dr. B. T. McGhie, former superintendent of the Orillia Hospital,

was also present.

The two buildings are exceedingly interesting places, thoroughly modern in design, and well fitted and furnished. They are connected by a tunnel with each other and also with the main building. In the boys' building, there are three playrooms with tile wainscotting in ivory finish and plenty of windows, ensuring abundance of light and fresh air. The dining rooms are fitted with steam tables. The bathrooms at either end of each floor are very complete with showers, baths, four basins, two toilets and a scrub tub in each. The floors throughout are of terrazzo. Altogether, the Ontario Hospital at Orillia is now one of the most complete and up-to-date institutions in Canada.

The new wing of the Alexandra Marine and General Hospital at Goderich was opened on October 29th. Founded thirty years ago at a very small cost, the Goderich Hospital now boasts property and equipment valued at \$75,000.

The Toronto Junior League has recently presented to the Sick Children's Hospital 322 new beds of the most up-to-date type, at a cost of \$10,000. These beds range in size from tiny affairs, not much bigger than dolls' beds, to those suitable for larger children. The Sick Children's Hospital of Toronto now has the finest bed equipment of any children's hospital on the continent.

In addition to this, on their own volition, the members of the Junior League added \$4,000 to their gift which was devoted to the building of a hydrotherapeutic tank, the first of its kind in Canada. This is used for the treatment of such conditions as may result from infantile paralysis. This particular branch of work will be in charge of a graduate in physiotherapy of the University of Toronto, who has taken special training under the Roosevelt Foundation.

The Honourable Minister of Health for Ontario has announced that the Provincial and Dominion Governments are prepared to meet 35 per cent (171/2 per cent each) of the cost of improving conditions in existing sanataria and preventoria. The Government is aware that there are not sufficient sanatorium beds in Ontario. These moneys will be provided from the special unemployment relief funds. We understand that, already, application is being made for approval of the extension of 100 beds for the Toronto Hospital at Weston, the Muskoka Hospital at Gravenhurst, the Mountain Sanathe torium at Hamilton and Queen Alexandra Sanatorium at London.

The third Annual Week of post-graduate lectures and clinics was given by the Medical Staff of St. Michael's Hospital, Toronto, during the week following the Canadian National Exhibition, viz., from September 14th to 19th inclusive.

The course proved to be an exceptional success, and now appears to have become established as an event which is regarded by many practitioners as a means of refreshing and extending their knowledge of scientific and clinical medicine in a way which is not readily obtainable elsewhere.

The next course has been planned to take place in September, 1932, and, as in the past, will be given free to all medical graduates. All enquiries or suggestions should be made to the Secretary of the Post-Graduate Course, St. Michael's Hospital, Toronto.

Dr. Eva Fisher, who has been spending the summer at her home in Toronto, left for Tobermory, where she will again engage in medical work under the Red Cross. This is the third season Doctor Fisher has spent in the northern peninsula where she is the only doctor, the nearest being 40 miles distant.

Dr. W. E. Gallie and Dr. A. L. Lockwood, both well-known Toronto surgeons, have been elected Vicepresident and Director, respectively, of the American College of Surgeons.

Dr. Frederick G. Banting, of Toronto, was recently honoured by the University of the State of New York, when the degree of Doctor of Science was conferred upon him at the University Convocation at Albany.

J. H. ELLIOTT

Quebec

The annual report of the Montreal Department of Health for 1930 maintains the standard of excellence set by the Department in its annual reports, which present a clear statement of health conditions in Montreal

and the activities of the Department.

A Board of Health was appointed in December, 1929, so that 1930 was the first year in which this advisory body functioned. It is composed of two representatives from the University of Montreal, two from McGill University, the Chairman of the Executive Committee, the Director of the Department of Health, and three alderman.

As compared with the year 1927, the expenditures of the Department have increased from \$274,201.58 to \$485,865.37, or from \$0.39 per capita to \$0.61 per capita. This has allowed for developments and for the much-needed increase of staff. In 1927, the Public Health Nursing Staff numbered 46 nurses; last year there were 95 nurses on the staff. Comparison is made with 1927, as this was the year covered by the Montreal Health Survey.

It is interesting to note that the estimates of population made by the Department are confirmed by this year's census figures. The birth-rate of 26 is below the average, which was 31 for the past ten years. The same is true of marriages which were 8.4 per thousand, as compared with an average of 9.4 for the preceding ten

The general death-rate of 12.9 per thousand, shown in this report, is the lowest rate experienced by Montreal. It represents a decided gain over the rate of 15.2, the average of the past ten years. An infant mortality rate of 124 is high, but it is low as compared with the records of past years. Diarrhea and enteritis are responsible for one-third of these deaths, and this indicates the need for more instruction in infant care. The mortality from tuberculosis continues to decline from a ten-year average of 143 deaths per 100,000 to 124 in 1930.

As shown by tables, the rates vary considerably for the different races making up the population of Montreal. The French-Canadian birth-rate is 31.9, and their infant mortality rate, 136. T 17.8 and 78 respectively. The British-Canadian rates are

Deaths from cancer and organic disease of the heart are increasing; deaths from pneumonia and bronchopneumonia are decreasing. The cancer rate for the first time went over 100, being 102; the average for the past ten years was 84.

The Division of Child Hygiene reports the development of mental hygiene as part of the school health service under qualified psychiatrists. School children in Montreal are all vaccinated, and as the city's hospital for smallpox is seldom occupied it is proposed to use it for the treatment of scabies. Immunization against diphtheria is carried out, and in 1930 the number of

completed immunizations was 11,532.

The report contains the details of the investigation made to control a small outbreak of typhoid fever. The Food Division confiscated 45,263 gallons of milk, 359 carcasses and 91,236 pounds of food-stuffs during 1930. A steady increase was shown in the number of milk producers using ice to cool milk, the percentage in 1930 being 91, evidence of success in the education

work among milk producers. Of the cows supplying milk for use in Montreal, 93 per cent are tuberculin tested.

While it records satisfactory progress, the report makes it clear that the Department of Health realize that much remains to be done, particularly in certain directions.

GRANT FLEMING

Saskatchewan

All maternity grants have been discontinued by the Saskatchewan government. The estimates passed at the last session of the legislature, providing for \$30,000 to May 1, 1932, have already been overspent by \$9,000 in the first five months of the fiscal year. To continue the grant at the rate at which it is increasing would neces sitate over \$140,000 for the year. Approximately about 10 per cent of mothers bearing children this year have applied for this grant; mothers in towns and cities have never been eligible for this. The grant consisted of \$25, of which \$10 went to the mother for a layette, and \$15 to the doctor or to the nurse or to the hospital, or was divided. Since the grant has been discontinued the government has supplied layettes directly to the mothers, so that the loss falls only on the medical attendant.

A dental clinic was held at the Red Cross Outpost Hospital in Carragana in October. Dr. Adams, the nearest dentist, who lives at Tisdale, sixty miles away, conducted the clinic which was held under the auspices of the Ladies' Auxiliary of the Hospital.

The staff of the Regina General Hospital have received a communication from the Saskatchewan Cancer Commission asking for recommendations for appointments to the Cancer Clinic about to be established in Regina. The positions which will be filled are: radiotherapist, who will be paid \$2,400; medical consultant and director, who will be paid \$900; and consulting surgeon, who will be paid \$600. The staff recommended to the Cancer Commission that Dr. C. M. Henry be appointed radiotherapist, that the head of the medical division be appointed medical consultant, and that the head of the surgical division be appointed surgical consultant. Since the heads of these divisions change every year this arrangement will give a large number of practitioners the opportunity of assisting in this work. All surgical work will be paid for by the patient or by the municipality where the patient comes from, if the patient is an LILLIAN A. CHASE indigent.

United States

The American College of Physicians.—The Sixteenth Annual Clinical Session of the American College of Physicians will be held in San Francisco, California, April 4 to 8, 1932. The headquarters in San Francisco will be the Palace Hotel, where the general scientific sessions, registration, and exhibits will be held. Clinics

will be conducted in various hospitals and institutions in San Francisco and near-by communities.

Dr. S. Marx White, Minneapolis, President of the College, has in charge the selection of speakers and subjects on the general program, while Dr. William J. Kerr, San Francisco, Professor of Medicine at the University of California Medical School, is the General Chairman of the Session, and is responsible for all local arrangements, in addition to the arrangement of programs and demonstrations. Following the San Francisco Session a post-convention tour will be conducted through Yosemite Valley, Southern California, (with two days in Los Angeles) and the Grand Canyon of Arizona.

The attention of the secretaries of various societies is called to the above dates, in the hope that their societies will select non-conflicting dates for their 1932 meetings.

American Board of Otolaryngology.—An examination was held in Indianapolis, Indiana, September 12, 1931, just prior to the meeting of the American Academy of Ophthalmology and Otolaryngology, held in French Lick, Indiana. Forty-three candidates were examined, of whom nine were conditioned or failed.

The Board will held an examination in New Orleans on May 9th, during the meeting of the American Medical Association, and in Montreal next fall, just prior to the Session of the American Academy of Ophthalmology and Otolaryngology.

Prospective applicants for certificates should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts Building, Omaha, Nebraska, for proper application blanks.

H. P. Mosher, M.D.,

W. P. WHERRY, M.D.,

President.

Secretary-Treasurer.

Vanderbilt University.—Dr. Francis R. Fraser has accepted an invitation to give the third series of the Abraham Flexner Lectures during the year 1932-33 at Vanderbilt University

Vanderbilt University.

Doctor Fraser is director of the medical clinic and professor of medicine in the Saint Bartholomew's Medical School and Hospital in London. He occupies an eminent position as an internist, and it is gratifying to the faculty of the school of medicine of Vanderbilt University that he has accepted this invitation.

Duke University.—Among the speakers at the formal dedication on April 20th of the School of Medicine and Hospital of Duke University, were Dean David Linn Edsall of the Harvard Medical School; Dr. Lewis Hill Weed, director of the Johns Hopkins School of Medicine; Dr. William Henry Welch, of Johns Hopkins; Dr. Watson S. Rankin, of Charlotte, director of the division of hospitals of the Duke endowment; Governor O. Max Gardner; of North Carolina; and Dean Thurman D. Kitchen, of Wake Forest College.

Fourteen wards in the new Duke Hospital, Durham, North Carolina, have been named after men prominent in medical history. Medical wards were named for William H. Welch of Baltimore, Sir William Osler, Josiah Clark Nott of South Carolina, Daniel Drake of Kentucky, and Walter Reed of Virginia; surgical wards for William S. Halsted of Maryland, Edmund C. F. Strudwick of North Carolina, Crawford W. Long of Georgia, Ephraim McDowell of Kentucky, and James L. Cabell of Virginia; obstetric wards for J. Marion Sims of South Carolina, François Prevost of Louisiana, and Henry F. Campbell of Georgia; the pædiatric ward for John Howland of Maryland.

General

Maternal mortality in Canadian cities, 1930.—The Dominion Bureau of Statistics issued on October 27, 1931, the number of maternal deaths in 1930 and the maternal death rate per 1,000 live births in certain cities of Canada. Deaths of non-resident women and births to such women are included in the totals on which the rates are based. The rates for 1929 are also given for comparison. It must be kept in mind, how-ever, that maternal mortality rates for individual cities fluctuate somewhat widely.

Number of deaths from puerperal causes and rates per 1,000 live births for certain cities of Canada

Number of live births puerperal causes ive Calgary 2,064 15 Edmonton 2,391 23 Halifax 1,555 15 Hamilton 3,394 21 London 1,485 17 1 Montreal 21,044 136	Rate per 1,000 e births	Rate per 1,000 live births
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Hamilton 3,394 21 London 1,485 17 1 Montreal 21,044 136	9.6	10.1
London 1,485 17 1 Montreal 21,044 136	9.6	4.8
Montreal 21,044 136	6.2	6.3
	1.4	3.7
011	6.5	5.8
Ottawa 3,028 23	7.6	8.5
Quebec 4,454 34	7.6	5.6
Saint John 1,224 6	4.9	8.7
Toronto 13,591 98	7.2	7.0
Vancouver 4,003 31	7.7	7.5
Winnipeg 4,629 22	4.8	6.3

Dr. Otto H. Warburg, of Berlin, German cancer specialist, has been awarded the Nobel prize in medicine for 1931.

years ago Dr. Warburg won the Sofie A. Nordhoff-Jung \$1,000 prize for cancer research. was at that time director of biology at the Kaiser Wilhelm Institute. He also has been active in the affairs of Palestine and at one time he headed the Palestine commission.

Book Reviews

Notes on Radium Therapy. H. A. Colwell, M.B., Ph.D., M.R.C.P., D.P.H., formerly director of the Radiotherapeutic Department and Lecturer on Radiology and Biophysics, King's College Hospital, etc. 162 pages, illustrated. Lewis & Co., London, 1931. Price 6s. net, H. K.

This little book was written for medical students and those wishing to know something about the physics and uses of this most important substance. The author carefully points out that it is not a text-book.

The first chapters deal simply and briefly with the physics of radium, its chemical effects, and the various methods of screening and applying it. Then follows a chapter on the technique of application in the breast, tongue, rectum, uterus, bladder, etc. In each case, the method described is that used by the accepted authority on that subject, e.g., Sampson-Handley's treatment of breast carcinoma, the Stockholm and Regaud's method of treating carcinoma of the cervix, and Birkett's treatment of tongue neoplasms. The book closes with a ment of tongue neoplasms. The book closes with a chapter on the dangers from radium, and the precautions necessary when one uses it frequently. This chapter is followed by one in which the value of radium, either by itself or as an adjunct to surgery, is proved statistically. Altogether, this is a most concise, and simple exposition of the subject.

The Criminal, the Judge, and the Public. A Psychological Analysis. Franz Alexander, M.D., Visiting Professor of Psycho-analysis at the University of Chicago and Hugo Staub, Attorney at Law, Berlin. Translated by Gregory Zilboorg, M.D. 238 pages. Price \$2.50. Macmillan Co., New York; Macmillan Co. of Canada, Toronto, 1931.

The authors of this book represent an unusual combination, Alexander being one of the leading psychoanalysts of the time and lately Visiting Professor of Psychoanalysis at the University of Chicago, while Their thesis is Staub is an attorney-at-law in Berlin. that the criminal is as legitimate an object for psychological investigation as is the neurotic or the normal individual, and here they have utilized psychoanalytical knowledge in an attempt to understand the personalities of those we call criminal. The book is intended for a wider field than medicine and should be read by all interested in human problems. It is a fairly simple statement, and does not pre-suppose any more psycho-analytical knowledge than is now possessed by the reading and thinking public.

The first part of the book takes up the problem of crime as seen in the light of psychoanalytic theory. Here are discussed such topics as "The rôle of psychology in the understanding of the criminal," and "The problem of responsibility and the rôle of medical expert opinion in the court." In the second part we find an interesting discussion of some criminal cases. has been much talk and writing on the problem of crime In recent years, and of the interested parties two groups have been unduly prominent. The first is composed of those who believe that one is born a criminal, as surely as one is born male or female and that nothing can be done about it. The other group are the reformers who feel that all the problems of crime can be solved by changes in the law, or by education, or by some altera-tion in the social scheme. There is an alternative, however, and that is to approach the problem in a purely scientific fashion, free from the bias of the one group and the emotionalism of the other. This book represents a splendid effort to apply the scientific approach and will be recognized as such even by those opposed to the conceptions of psychoanalysis.

Text-Book of Pathology. F. Delafield, M.D., LL.D., Sometime Professor of the Practice of Medicine, College of Physicians and Surgeons, Columbia University and T. M. Prudden, M.D., LL.D., Sometime Professor of Pathology, College of Physicians and Surgeons, Columbia University, New York. 15th edition. 1339 pages, illustrated. Price \$10.00. William Wood & Co., New York, 1931.

When a text-book has reached its fifteenth edition in the course of forty-five years little need be said by way of recommendation to its constituency. When it is known that the revision of the book since the appearance of its last edition four years ago has been in the hands of Dr. Carter Wood, of Columbia University, the readers may be confident that it has been thoroughly brought up to date.

The book can be strongly recommended for consultation by students and practitioners alike, both on account of the accuracy of the information, the diverse subject matter with which it deals, and the useful and up-to-date references supplied in the form of notes at the foot of the pages.

It is of course a difficult matter to preserve a proper balance between the important and the relatively unusual, between the condition met with every day and the rarity, but we think that an admirable balance in this respect has been preserved throughout this book. Perhaps we might venture to suggest, however, that four lines is scarcely sufficient in which to deal adequately with the subject of syphilitic disease of the kidney.

We think that a book of this kind would retain its

standard of usefulness while reducing its bulk consider-

ably, by omitting the parts treating of animal parasites and the morphology of pathogenic bacteria. The student naturally turns to special text-books for information on these subjects and any reasonable reform which reduces the size and weight of text-books is advisable.

The illustrations throughout are excellent. Although they represent all the various stages of advance in book illustrating during more than a generation it is doubtful if the modern photomicrograph has much advantage over the carefully done, if more diagrammatic, drawing of thirty years ago, at any rate for teaching purposes. The printing is clear and the general appearance of the book is altogether admirable, as indeed has been the case with the preceding editions.

Diseases of the Stomach. Hugh Morton, M.D., Fellow of the Royal Faculty of Physicians and Surgeons, Glasgow. 184 pages, illustrated. Price 10/6. Edward Arnold & Co., London, 1931.

This is a concise account of the diseases of the stomach for the use of medical students and general practitioners. The symptoms of the various diseases are described clearly and in some detail, and their etiology is also well explained. Some fifty pages are devoted to an account of gastric neuroses. These chapters are particularly well done and should help one more easily to classify many of the puzzling cases seen perhaps more in out-patient or private practice than in hospital wards. Of course, these patients have symptoms referable to their stomachs, but one wonders whether they should not be considered as suffering from nervous disorder rather than from disease of the stomach. Good accounts are given of peptic ulcer and neoplasm of the stomach, but here again a student would perhaps do better to consult a larger work, but for a quick clear review of the subject, with no quoting of percentages or theories, the book is admirably adapted for the general practitioner.

It can be easily seen that this book is the product of an exceptionally well trained man, of large experience in practice. If anything, his examples are given in too great detail, and, under Treatment, he gives long lists of various foods and medicines, proprietary and otherwise, which he has found useful. These things would often be just what were wanted by a busy practitioner, particularly in Scotland or elsewhere in the British Isles, but might often be hard to obtain and expensive elsewhere. The book, therefore, is likely to be useful not so much to the medical student reading the subject for the first time or preparing for an examination as to the general practitioner to whom it is strongly recommended.

Text-Book of Neuro-Anatomy. Albert Kuntz, Ph.D., M.D., Professor of Micro-anatomy in St. Louis University School of Medicine. 359 pages, illustrated. Price \$5.50. Lea & Febiger, Philadelphia, 1931

Any attempt on the part of the non-specialist to obtain a sufficiently adequate grasp of the anatomical structure of the nervous system too often swamps him in a bewildering mass of detail. The author of this text-book, a man of undoubted authority within the field, has evidently attempted with a good measure of success to present the essential facts in a logical and unified arrangement. The developmental and comparative points of view are introduced only insofar as necessary to a rational understanding of the human nervous system, and, while physiological concepts are used in certain essential places, yet there is nowhere any tendency to trespass unduly on purely physiological domains. Short bibliographies follow each chapter and the book is well and clearly illustrated. A few of the photomicrographs, however, are somewhat confusing, and, if better reproduction is unattainable, they could be advantageously replaced with drawings. whole, this book should be of definite value to those who

have to teach the subject as part of an already well weighted medical curriculum.

Monographs of the Pickett-Thomson Research Laboratory. Vol. 1. The Vitamins. 575 pages. Price 42/- net. Baillière, Tindall & Cox, London, 1931.

Every year sees a greater number of reviews and summaries on selected subjects. The volume under review belongs in this category but is of a size and style which raises it at once to the highest possible level of excellence. It is unlikely that anything else of the kind will be published for a long time. Any future compilations on vitamins can safely begin where this one has left off, as it takes under survey the most important aspects of the subjects and those about which there is most discussion. As Dr. Browning points out, the nature of vitamins is still being hotly debated. Their isolation as chemical entities has not been accomplished, although it may seem to be imminent. Some believe that it never will be accomplished, because in their opinion vitamins are not chemical entities at all but are to be expressed in terms of high energy or surface tension.

Dr. Browning's work cannot be too highly praised as a detailed and yet condensed account of all the most significant research on vitamins. The book, indeed, is much more than a mere summary of other people's work. It is divided into three parts, the first of which deals with vitamins in general, their origin, mode of action and nature, their stability and mineral relationships, their relationship with bacteria, the disturbances that their absence cause, and their estimation. In the second part the fat-soluble vitamins A, D and E are taken up in detail and in part III the water-soluble vitamins B and C. To these are added tables showing the vitamin content of foodstuffs. The author's summary and conclusions and a gigantic list of references complete one of the most ambitious and successful reviews that has appeared in recent years.

Bendien's Diagnostic Methods for Cancer and Principles of Treatment. A. A. Miller, M.D. With an introduction by Dr. S. G. T. Bendien. 79 pages. Price 3/6 net. H. K. Lewis, London, 1931.

The author of this little work spent some time at Zeist with Doctor Bendien, and was, therefore, able to acquaint himself at first hand with the Dutch scientist's views on the nature, diagnosis, and treatment of cancer. He has endeavoured to give a short account of Doctor Bendien's researches. Modern views on cancer are referred to, and note is made of the work of Gye and Maud Slye as champions of the exogenous and endogenous factors in the etiology of cancer, respectively. A very brief account is given of the biochemistry of cancer. Bendien's views as to the nature of cancer are simply presented and the details of his flocculation and spectro-photometric tests follow. The presentation is perhaps not sufficiently complete to satisfy laboratory workers, nor was this intended, but is explicit enough to acquaint those interested in the diagnosis of cancer with the rationale of Bendien's method. The last chapter deals with Bendien's method of treatment of cancer by means of a serum which, when injected into cancer patients, can alter favourably the electrical (colloidal) charge of their sera. According to the author good results have been obtained in this way. The book will' be helpful to those who want to be informed on a very interesting piece of research, conducted along new lines.

Proceedings of the Second International Congress for Sex Research, London, 1930. Edited by A. W. Greenwood. 637 pages, illustrated. Price, 21/net. Oliver & Boyd, Edinburgh and London, 1931.

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common to such publications; it is a series of snapshots rather than a map of the terrain with which it deals, and continuity is largely accidental; nearly all of the data presented have been set forth more fully elsewhere; and, though half the articles are in English, five languages are represented. But it offers an interesting cross-section of the present-day scientific attitude to sexual problems, and many distinguished names may be found among the authors of the eighty individual papers. Nearly half the book is devoted to the endocrinological aspects of the field, and to those interested in these aspects it may be recommended with confidence. Among the subjects discussed are the influence of diet on procreation, the development and regeneration of the gonads, the relation of sex hormones to the plumage of birds, the hormone of the corpus luteum, the clinical use of the male hormone and of æstrin, the spermatocidal power of soap, the psychology of sex in the child, the use of the mediæval "girdle of chastity"—to name only a few. These have been arranged, as far as possible, in a rational order; the illustrations are well reproduced; and the book is attractively set up and bound.

Official History of the Great War. Medical Services, Casualties and Medical Statistics of War. Major T. J. Mitchell, D.S.O., M.D., Ch.M., Royal Army Medical Corps and Miss G. M. Smith, M.B.E., M.A. 382 pages, price £1 1s. 0d. Published by His Majesty's Stationery Office, London, 1931.

This volume completes the series of volumes on the Medical History of the War. It deals with the statistics relating to the wounds, diseases and injuries caused by the war, and has been compiled to preserve in accessible form the losses of the British Army and to serve as a basis for the study of casualties in any future war. The preparation of such a volume has entailed an enormous amount of labour and expense and the authors are to be congratulated on their success in reducing a vast mass of documents to orderly form and compiling reference tables to the various casualties and their results. A chapter has been added by Dr. Alexander Sanderson, O.B.E., on the after-effects of war dealt with by the Ministry of Pensions, which has awarded the vast sum of £900,-000,000 in pensions and compensations since the close of hostilities.

The chief function of the medical service is the care of the wounded and sick, and to carry out these duties satisfactorily careful calculations of the probable number of wounded in any military movement and the average number of sick is of the greatest importance. Transportation of wounded men to field dressing stations, field ambulances, casualty clearing and base hospitals must be arranged before a battle, and for this purpose the Army Commander and his staff should be in close touch with the Senior Medical Officer. In the earlier stages of the war there was no medical representation on the General Staff and lack of co-ordination led to much confusion and inability to deal adequately with the large number of casualties. A similar condition existed at first in the French forces, and even in the American armies, with a medical service of about 10 per cent of troops engaged, there was the same difficulty.

The authors take up in detail year by year the number of troops engaged, detailing battle and non-battle casualties, the classification and percentages of total casualties and the results, the permanent losses for military purposes in the field, the temporary losses for military purposes, the numbers admitted to hospitals and the accommodation provided in hospitals and convalescent depots. The principal causes of inefficiency are also tabulated in the different theatres of war and the incidence of various maladies affecting the troops can be readily ascertained by a reference to the numerous tables giving these conditions in detail. After the close of hostilities questions of

pensions and gratuities occupy the Ministry of Pensions. The methods of dealing with applicants is set forth in detail and also the provisions for the care of disabled men. An idea of the magnitude of these tasks may be formed from the fact that by March 31, 1929, 1,420,000 cases or 23.6 per cent of the total who served had been awarded pensions or gratuities.

Official History of the Australian Army Medical Services 1914-1918. Vol. 1, Gallipoli, Palestine and New Guinea. Edited by Col. A. G. Butler, D.S.O., V.D., B.A., M.B., Ch.B., A.A.M.C., Melbourne. 873 pages, illustrated. Price 21/6 net. Published by Australian War Memorial, Melbourne and Australian Trade Commissioner in Canada, 36 Yonge St., Toronto, 1931.

This is one of the best written of any of the histories covering the activities of our Forces in the Great War. As compared with the sphere of action of the C.A.M.C., the Australians were to see much more of the world and much more diversified methods of warfare. That they came through with credit to themselves and to their great Commonwealth did not need the telling in this history, for it is too well known. The details, however, as now presented, are in the highest degree interesting, and most valuable from a technical and historical standpoint.

Three theatres of war are covered, viz., the Gallipoli campaign, the campaigns in Sinai and Palestine, and operations in connection with the occupation of German New Guinea. There is also an admirable historical sketch of the origin and growth of the A.A.M.C. from the earliest times. The numerous illustrations are well selected and most interesting, while the press work and general "get-up" of the volume leave little to be desired.

Like the A.M.C. of the other dominions, the Australian Medical Corps was officered nearly wholly by civil practitioners. Many of these, however, like their Canadian confrères, had had training in the training in the active militia of the Commonwealth, and this, in a large measure, accounts for the efficiency of the corps and the outstanding work which it was able to accomplish. This training, combined with a zeal and energy never excelled, gives high place to the medical profession of the Commonwealth.

The principles of war remain the same in all campaigns, but time, place and circumstance place burdens upon those who fight their country's battles. This history shows how some of the most intricate and dangerous situations had to be dealt with, and will be read with keen interest by all who have the welfare of the defence forces at heart; and it may be added, the layman will find much to absorb his attention and arouse his sympathy in these pages.

It is noted that the title of the book describes the Great War as "the War of 1914-1918". The Canadian Militia List refers to the conflict as the "War of 1914-1921", probably using the latter date as the year in which the last treaty of peace was signed.

Nurse's Medical Lexicon. Thomas Lathrop Stedman, A.M., M.D., Editor of "Twentieth Century Practice of Medicine", etc. 629 pages. Price \$2.00. William Wood & Co., New York, 1931.

This medical dictionary, by the editor of the well-known "Practical Medical Dictionary," has been prepared for the use of graduate and student nurses, of pre-medical and dental students and of the general public. The editor has endeavoured to include all terms of which definitions would be desired by these nurses and students and has excluded from this lexicon certain of the data found in regular medical dictionaries which are not likely to be used by those for whom this work is intended. In order to meet their requirements a number of elementary definitions have been given and this feature should make it of value to dental hygienists,



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physicians, and dentists' office assistants, public health workers, and those of the general public who may feel the need of an interpreter of words borrowed by the lay writer from the language of scientific medicine. The short appendix contains certain weights and measures, comparative temperature scales, poisons and antidotes, and comparative data respecting infectious diseases.

Asthma and Hay Fever in Theory and Practice. Parts I, II and III. Arthur F. Coca, M.D., Professor of Immunology, Matthew Walzer, M.D., Instructor in Applied Immunology, Cornell University, and August A. Thommen, M.D., Lecturer in Medicine, University and Bellevue Hospital Medical College. 851 pages. Price \$8.50. Charles C. Thomas, Springfield, Ill., and Baltimore, Md., 1931.

This is the most ambitious attempt of recent years to cover both the theoretical and practical sides of asthma and hay fever. In order to do so in the most comprehensive manner the subject has been divided amongst three writers. Dr. Coca deals with Hypersensitiveness, Anaphylaxis and Allergy; Dr. Matthew Walzer takes up Asthma, and Hay Fever is dealt with by Dr. August A. Thommen. This has proved to be an excellent plan of presentation. Doctor Coca's researches stamp his writing with great authority, and his description of the modern view on these matters may safely be accepted as complete. It should be added, however, that in spite of his long-continued support the conception of atopic disease (a term coined by Coca himself), as distinct in some respects from hypersensitiveness, has not been very generally taken up by workers in this field. From the practical point of view he includes a most valuable chapter on the preparation of extracts and solutions for use in testing and treatment in human hypersensitiveness.

Doctor Walzer's survey and views on asthma occupy the largest section of the work. No aspect of the theory, pathology, diagnosis and treatment has been omitted, and it is refreshing to find that there is no fanatical or exaggerated support of treatment by desensitization. Each factor in the causation of asthma is given its place of importance and a wide and balanced view of treatment results.

One cannot help interjecting a comment on his distressing misuse of the word "pathology". Doctor Walzer speaks of pathology in the nose, etc. One realizes, of course, that he is merely following the common slovenly habit of modern medical writing, but it is none the less unpleasing and indefensible. As has been said somewhere else, we shall not be surprised some day to find in the marriage ceremony the phrase "in sickness and in health" altered to "in pathology and physiology".

Doctor Thommen's section exhibits the same exhaustive method of approach. We can recall no book on the subject which gives such a wealth of detail on plants and their seeds. The illustrations are unusually good and instructive.

Taken all round, one will not expect a more thorough book on this subject for some time. The authors are to be congratulated on their care and reasonableness of statement, and the publisher on the satisfactory form in which these have been produced.

9. Technical Methods. By various authors. 364 pages. Price £1 1s. 0d. Published by His Majesty's Stationery Office, London, 1931.

This is the final volume of this system. It is devoted to matters of bacteriological technique such as the microscopic demonstration of bacteria, the preparation of culture media, the cultivation of spirochætes, preparation of bacterial suspensions, filtration, viruses (the staining of virus bodies and cultivation of viruses themselves), and bacteriophage. These matters occupy roughly less than half of the volume,

the rest being devoted to biochemical investigations, the technique of serology and the preparation of toxins and antitoxins, and the experimental production of anaphylaxis. Valuable details are given as to the breeding, maintenance and manipulation of laboratory animals, with short chapters on the production of variant strains of organisms, vitamin A deficiency, the determination of electric charge, and the estimation of destructive effects of ultra-violet rays and of the power of disinfectants. The general index to the system is included in this volume.

This system of bacteriology should stand as a comprehensive and authoritative guide for some years. One would have liked, however, to see provision made for the constant enlargement and alteration which the subject calls for. What, for example, will be our views five years hence regarding viruses, to mention only one of a host of obscure subjects?

Resistance to Infectious Diseases. Hans Zinsser, M.D.,
Professor of Bacteriology and Immunity, Harvard
Medical School. Fourth edition. 651 pages.
Price \$7.00. New York: Macmillan Co.; Toronto:
Macmillan Co. of Canada, 1931.

This is the fourth edition of "Infection and Resistance," first published in 1914, and whose last edition appeared in 1924. It continues to be the same excellent fund of information concerning matters immunological as its predecessors. There has been a considerable amount of revision and amplification in accordance with the more recent advances in our ideas of infection and immunity.

The work is divided into two parts. The first section deals with the general principles and problems of infection and resistance. This is complete and deals with the subject in detail. The second section discusses the special phases of the relationship of infection and immunity applied to the study of the various infections and infectious diseases.

While there may be some minor flaws in this work, visible to the eye of an expert immunologist, the reviewer feels that this is one of the best books of reference and texts on this subject in our language.

Abdominal Pain. John Morley, Ch.M., F.R.C.S., Honorary Assistant Surgeon, Manchester Royal Infirmary, etc. With an introduction by J. S. B. Stopford, M.D., F.R.S., Professor of Anatomy, University of Manchester. 191 pages, illustrated. Price \$3.00. Edinburgh: E. & S. Livingstone; Toronto: Macmillan Co. of Canada, 1931.

In his introduction to this small volume the author states that it has been written "because of a growing conviction that the prevalent theories of abdominal pain are, in important respects, physiologically unsound." In an attempt to explain the mechanism of production of abdominal pain, he has drawn on his own personal experience as a surgeon, and the experiments which he carried out on some of his patients with organic abdominal lesions. The various theories as to the causation of abdominal pain which have tinctured the views of surgeons during the past forty-four years are discussed, commencing with those of James Ross, of Manchester, K. G. Lennander, Sir James MacKenzie, Sir Henry Head, A. F. Hurst, and H. Kappis. The merits and demerits of each theory are carefully weighed and each has been found wanting in some particular. Morley has evolved a new concept of the origin and cause of abdominal pain, which he describes under the two closely related mechanisms termed "peritoneo-cutaneous radiation" and "peritoneo-muscular reflex". He sets out clearly the reasons for making his deductions, and he has painstakingly applied his theory to lesions of the stomach and duodenum, the biliary system, pancreas



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and spleen, the vermiform appendix, the intestines and the mesentery, the kidneys, ureter and bladder, as well as the male and female genital organs.

This book is well written, and, though somewhat controversial, clearly sets forth Morley's views on this important subject. It is a stimulating expression of opinion and is well worth reading.

An Introduction to the Literature of Vertebrate Zoology, based chiefly on the titles in the Blacker Library of Zoology, the Emma Shearer Wood Library of Ornithology, the Bibliotheca Osleriana, the Gest Library of Chinese Literature and other Libraries of McGill University, Montreal. Compiled and edited by Casey A. Wood, M.D., LL.D., Collaborator, Division of Birds, Smithsonian Institute. 643 pages. Price \$15.00. Oxford University Press, London, 1931.

Many of us, in medicine and science to-day, are perhaps too prone to think that the chief function of a library is to supply us as promptly as possible with volume fifty of "S. G. & O.," or whatever contemporary journal we may be in search of at the moment. forget that the ideal library should represent not only the present but the past also, and that its shelves are a pageant of the history of thought. McGill, with the memory of Osler before it, should be less liable than other universities to fall into this error; yet the error is excusable anywhere, so insistent are the demands of the present, and so vague, numerous, and confused the voices of the past. We owe, therefore, a great debt to workers who, like Dr. Casey Wood, have collated and interpreted these voices for us. This volume, then, is a guide to the literature of vertebrate zoology, ancient and contemporary, as it is represented-and it is exceedingly well represented, thanks not a little to Doctor Wood himself-in the collections at McGill. The main part of the book is modestly described as a catalogue-a "partially annotated catalogue of the vertebrate zoological items in all the University libraries." But it is a catalogue with an imagination, a patient devotion, an enormous scholarliness. Open it at random and read three successive entries: "Chichester", "Chi Huang", "Chikhachev"; note that the last name has been transliterated from the French version of the name, "Tchihatcheff", which appears on the title-page of the book referred to. Turn a few pages, and find Wang Cho's "Lung ching, a short compilation on the dragon." Glance at the succinct annotations, and remark that the "Etymologiæ" of St. Isidorus of Seville has earned its place because "Liber XX. Cap. 12 is entirely devoted to animals," and Koldewey's "German Arctic Expedition of 1869-70," because there are "some 24 references to birds, scattered throughout the volume." Imagination, devotion, scholarliness! These qualities are rare in catalogues, and disarm criticism. It is a little odd to find Newton Harvey's "Nature of Animal Light" which reviews the little that is known of the mysterious chemistry of luminescence in animals, described as "a little work on faunal psychology", but such trivial slips are few—how few, probably none but the learned compiler is competent to judge. The catalogue is preceded by an index in chronological and geographical order, and this in turn by a long but concise introduction, in which the various classes of the books, manuscripts, periodicals, drawings and so forth are dealt with by subjects, each subject taken chronologically—an introduction which should enable even the beginner to make use of the great catalogue itself, and through it the libraries—a key, not only to the collections at McGill, but almost equally well to any libraries of similar scope and standing. The book is most handsomely printed and produced, and will be invaluable to those who aspire to Doctor Johnson's "second kind of knowledge" knowing where information on a subject may be found.

The Note Book of Edward Jenner in the Possession of the Royal College of Physicians of London. 49 pages. Price \$1.25. Oxford University Press, London; McAinsh & Co., Toronto, 1931.

This excellent booklet adds yet another to the lengthy list of publications dealing with Edward Jenner. It consists of three parts: a preface giving the history of the manuscript; an introductoin taking the form of an extremely interesting biographical sketch, written by Dawtrey Drewitt, F.R.C.P., entitled "Jenner's Work as a Naturalist"; and finally, Jenner's Note Book now printed for the first time.

Jenner lived in a period when natural history commanded a great deal of attention. Linnaeus, a Swedish physician, had recently published his classification of plants and animals; in geology, the study of fossil remains was opening up new vistas, Cook's voyages were providing a wealth of new oriental material for the museums, and it is interesting to note the prominent part taken by physicians in these new developments. It is to this side of Jenner's career that the biographer gives attention. John Hunter, as usual, is the stimulat-Answers to his numerous questions ing influence. produce, amongst many lesser findings by Jenner, one so unusual that the Royal Society refused to publish the paper for a year. It dealt with the life history of the cuckoo in general, and the extraordinary habits of the young cuckoo in particular. The migration of birds also claimed attention and again Jenner finds himself in opposition to the accepted ideas of the time. It was generally believed that the disappearance of birds during the winter was due to their hibernation. Jenner, for the first time, insisted upon the importance of migration as the cause of their disappearance from the One of Hunter's questions, however, countryside. 'What the devil becomes of eels in winter?'' had to wait for a complete answer until the last few months,

a matter of 150 years.

The actual Note Book covers the period from 1787 to 1806, and records various observations on the cuckoo, the presence of hydatids in the bodies of various animals, and concerning the distemper in dogs. The first part, while shorter than the others, is by far the most important, dealing as it does with a valuable discovery. Jenner is convinced, in the second of this series of observations, of the relationship of tubercles and hydatids; while in the third, he adds little beyond the presence of extensive inflammation in the lungs, to the knowledge regarding this enemy of dog-lovers. They all show, however, his tremendous industry, his powers of observation, and his painstaking care.

The book is well prepared, the printing excellent, and it will be a very welcome addition to the library of any one interested in medical history in general, and in Jenner in particular.

Studies in Photo-activity and Therapy of Tungsten-Titanium Arc. J. Burdon-Cooper, M.D., B.S., B.Sc., F.R.C.S.E., late Lecturer Physiological Optics, Department of Ophthalmology, and Arthur Roberts, T.D., F.R.C.S.E., M.R.C.S., Consulting Aural Surgeon, University of Oxford. 86 pages, illustrated. Price \$3.50. Bristol: John Wright & Sons; Toronto: Macmillan Co. of Canada, 1931.

This book is devoted to a discussion of experiments to show the efficiency of the tungsten-titanium are as compared with the tungsten, carbon and mercury arcs. An original method of photographing the light from these arcs after it had passed through a finger, also through a piece of fresh ox hide, 5/16" thick, is used. From the results shown in the photographs it can be seen that the light from the tungsten-titanium arc is the more penetrating.

A series of experiments are described to show the bactericidal action of the light from the arc, using a culture of *B. coli* on agar in Petri dishes. With no screen no growth took place. With a screen of fresh

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ox hide there was a little inhibition of growth, showing that no bactericidal rays had passed through the hide. With a screen of Chance's opaque glass no growth occurred. With a glass screen growth was complete. With a quartz screen growth was inhibited about 75 per cent. These results show that ultraviolet radiation can penetrate 5/16" of ox hide. The authors found that tissue containing blood was more opaque. A short chapter is devoted to the infra-red emission of the arc. The electrodes are composed of pure tungsten 98 per cent, titanium 1½ to 2 per cent, and a small amount of chromium.

They found that the tungsten-titanium are radiation contains almost twice as much erythema-producing radiation as non-erythema-producing, which accounts for its relative activity, whereas the tungsten-are radiation contains about the same quantity of each.

A series of selected cases with methods of treatment is given at the end. On the whole the book has the appearance of being unduly prolonged. All the original matter could easily have been incorporated in an article in a periodical.

Physical Signs in Clinical Surgery. Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London. Third edition. 278 pages, illustrated. Price \$7.50. Bristol: John Wright and Sons; Toronto: Macmillan Co. of Canada, 1931.

In the preface of the first edition the author states that "the history and physical methods of examination must always remain the main channels by which a diagnosis is made." This is sound, and accordingly the author has produced a work which reveals to the student and the practitioner what resources he has within himself to solve the problems of diagnosis, and how to utilize them properly and efficiently. These methods are the very essence of the process of diagnosis, for which the laboratory is not a substitute.

In this edition new figures have been introduced, some not essential have been omitted, and some additional signs and a chapter on gangrene have been incorporated. The arrangement of the work according to regions and parts is satisfactory and convenient for reference. The book is well written, clear and concise, and the many illustrations are all that could be desired as to selection and quality. The press work is good.

and quality. The press work is good.

It will be found a most useful and satisfying book and can be recommended unreservedly to both medical students and graduates. To the former in particular it will make a strong appeal to their needs and be found to meet the requirements well.

Manual for Mental Deficiency Nurses. By authority of The Royal Medico-Psychological Association. 521 pages, illustrated. Price 6/- net. Baillière, Tindall & Cox, London, 1931.

This comprehensive volume contains much valuable information difficult to obtain in the usual volumes on nursing. It has been written especially for the guidance of nurses in charge of mentally deficient patients and for candidates for nursing certificates in this field by a special committee of the Royal Medico-Psychological

Association. This volume should not be confused with its elder sister, the "Handbook for Mental Nurses." While the chapters on anatomy, physiology, first-aid, physical diseases, etc., are well written and illustrated, the chapters of most value to the general reader are those on mental deficiency, the education and training of mentally defective children, and the industrial training of the mentally defective. The various methods of training the child are considered in some detail and this is followed by an interesting review of the various industrial and other occupations which may be developed in a colony for mental defectives or which may be followed outside in "industrial centres." Although written primarily as a text-book for mental nurses, these special chapters would prove of real value to the physician or lay worker interested in this aspect of social welfare.

BOOKS RECEIVED

- United Fruit Company Medical Department. 19th Annual Report. 276 pages, illustrated. Published by the United Fruit Co., Pier 3, North River, New York, 1930.
- Aunals of the Pickett-Thomson Research Laboratory.

 Vol. 7. Pathogenic Streptococci. 442 pages, illustrated. Price \$10.00. Published for Pickett-Thomson Research Laboratory by Baillière, Tindall & Cox, London; Williams & Wilkins Co., Baltimore, 1931.
- Aids to Physiology. Henry Dryerre, Ph.D., M.R.C.S., L.R.C.P., F.R.S.E., Lecturer in Physiology, Heriot-Watt College, Edinburgh, etc. 255 pages, illustrated. Price 3/6 net. Baillière, Tindall & Cox, London, 1931.
- Medical Clinics of North America. Vol. 15. no. 2. Philadelphia number. By various authors. Issued serially every other month. 300 pages, illustrated. Price \$18.00 (6 numbers). London and Philadelphia: W. B. Saunders; Toronto: McAinsh & Co., 1931.
- Medical Report for Year 1930. Glasgow Royal Maternity and Women's Hospital. Prepared by H. R. MacLennan, M.B., Ch.B., Registrar to the Hospital. 100 pages. Aird & Coghill, Ltd., Glasgow, 1931.
- Management of Abdominal Operations. Rodney H. Maingot, F.R.C.S., Surgeon, Royal Waterloo Hospital, London. 312 pages. Price 7/6 net. H. K. Lewis & Co., London, 1931.
- Surgical Clinics of North America. By various authors.
 Vol. 11, no. 5, October. Issued serially, every
 other month. 300 pages, illustrated. Price \$18.00
 (6 numbers). London & Philadelphia: W. B.
 Saunders; Toronto: McAinsh & Co., 1931.
- An Introduction to Hygiene. W. Robertson, M.D., D.P.H., F.R.C.P., formerly Medical Officer of Health, Edinburgh and Leith, etc. 208 pages. Price \$2.00 Edinburgh: E. & S. Livingstone; Toronto, Macmillan Co. of Canada, 1931.

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